# Firestone
## GROUND GRIP TIRES

## AMERICA'S *First Choice* TRACTION TIRES ARE NOW SO *Easy to Buy* THAT *Every Farm* CAN BE PUT ON RUBBER . . .

**Triple-Braced Traction Bars**

*A patented Firestone construction feature which provides the extra traction so necessary to deliver maximum draw-bar pull for plowing, pulling and all farm operations. Only in Firestone Ground Grip Tires do you get this exclusive and patented feature.*

FIRESTONE Ground Grip Tires are *first in sales* and *first in performance* — and this has been true ever since Harvey S. Firestone developed the *first* practical pneumatic tractor tire and *put the farm on rubber.* And, now every farmer can enjoy the long years of comfort and the savings of time, work and money which only Firestone Ground Grip Tires provide.

***The Firestone Special Farm Payment Plan***

enables you to equip your tractor and all wheeled farm implements with Firestone Ground Grip Tires simply by making a small down payment. This plan further provides for payment of the balance on terms that suit your individual requirements.

***The Firestone Cut-Down Wheel Plan***

provides a method for cutting down the spokes of the steel wheels on your tractor and implements. A new Firestone drop center rim is then welded to them. Originated and perfected by Firestone, this operation is quick and economical and brings you the added comfort and savings in time and fuel which only Firestone Ground Grip Tires can give you.

***The Patented Construction Features and Exclusive Advantages***

of Firestone Ground Grip Tires enable them to save more time and fuel, provide more traction and draw-bar pull — ride more easily and clean better in all soil conditions because the construction features which make these advantages possible are fully covered by United States patents:

**Triple-Braced Traction Bars,** which cannot bend, break or tear off.

**Longer Tire Life,** because of the patented Firestone Gum-Dipping process which protects against penetration of moisture, and provides greater strength. Patented tread compound protects against sun and weather.

**Tread Guaranteed Not to Loosen,** because two extra layers of Gum-Dipped cords provide inseparable union between the triple-braced tread and cord body.

**Scientifically-Spaced Triple-Braced Traction Bars** provide better cleaning action in all soil conditions.

**52 to 89 Extra Inches of Traction Bar Length** give greater earth-biting power.

**32% Greater Tread Bar Surface Contact** assures increased pulling power.

**21% Flatter Triple-Braced Tread** provides greater shoulder traction.

**Continuous Triple-Braced Traction Bars,** joined together for smoother riding.

***The Firestone Demonstration Plan***

You can prove the extra traction advantages of Firestone Ground Grip Tires on your own farm. There is no obligation for a demonstration of Firestone Ground Grip Tires. Send in the coupon or call on your nearby Implement Dealer, Firestone Tire Dealer or Firestone Auto Supply and Service Store and find out how little it costs to put your farm on rubber.

SEND THIS COUPON IN TODAY!

**BATTERIES**
For a quicker start and more of them, be sure your new battery is a Firestone. Ask about the economical Firestone Battery Changeover Plan.

**SPARK PLUGS**
Get better performance and greater economy from your car or truck by installing a set of Firestone Spark Plugs today.

**BRAKE LINING**
It takes safe brakes as well as safe tires to make a safe car. Insist on Firestone Brake Lining when you have your brakes relined.

## Firestone CONVOY TIRES
### FOR CARS, TRUCKS AND SCHOOL BUSES

The Firestone Convoy Tire delivers long, safe mileage on rural roads at low cost per mile. This high quality, long mileage tire is Triple-Safe against the dangers of blowouts, punctures and skidding.

| | |
|---|---|
| 4.50-21 | $8.10 |
| 4.75-19 | 8.35 |
| 5.00-19 | 9.00 |
| 5.25-18 | 9.65 |
| 5.50-17 | 10.50 |
| 6.00-16 | 11.80 |

**Listen to THE FIRESTONE VOICE OF THE FARM.** Everett Mitchell interviews Champion Farmers every week during noon hour.

**Listen to THE VOICE OF FIRESTONE** featuring Richard Crooks and Margaret Speaks and Alfred Wallenstein, Monday evenings, N. B. C. Red Network

The Firestone Tire & Rubber Company, Akron, Ohio
Gentlemen: Without obligation on my part, please send me:

( ) A copy of the new 1939 Firestone Farm Guide Book.
( ) Full information about the Firestone Special Farm Payment Plan.
( ) Full details of the Firestone Cut-Down Wheel Plan.
( ) Please demonstrate the performance and economy of Firestone Ground Grip Tires with my own tractor on my own farm.

Make and model of tractor.....
Please demonstrate on.....(date)
Name.....
R.F.D. or Street Number.....
Town.....County.....State.....(m)

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Copyright, 1939, The Firestone Tire & Rubber Co.

# "ORCHARD BRAND PRODUCTS PAY OUT!"

# APPLE BILL says:

*"RIGHT NOW is the time to think about your spray program."*

And it is also the time to resolve not to *gamble* on your spray program. For it is only through soundly planned spray programs—starting with the dormant and ending with the last cover—that orchards can be maintained at a high level of production efficiency.

The Orchard Brand line is designed to fulfil every requirement for a complete spray program. These products are made under the strictest standards of chemical manufacturing control. *They are your best guarantee for a spray program that will help you carry through to a profitable harvest.*

*A New and More Convenient Control for Peach Tree Borer:*

**ORCHARD BRAND E. D. E.†** (ETHYLENE DICHLORIDE EMULSION) is used in the north during the fall or spring, and in the south, during the winter months. It is merely sprayed or poured, wetting the lower trunk of the tree and the soil.

*Dormant Sprays for Fruit Trees:*

**ORCHARD BRAND OIL EMULSION "83"*** is a free-flowing quick-breaking emulsion that provides effective control of scale, red mite and leaf roller. It may be used in combination with SprayCop Copper Fungicide for control of peach leaf curl.

**ORCHARD BRAND DORMASOL*** A tank mix oil that is exceptionally high in actual oil. An advanced and economical oil spray for same purposes as Orchard Brand "83."

**SUPERIOR SCALE OIL** miscible oil that contains Cresylic Acid for control of aphis as well as scale and red mite. May be used in the dormant or delayed dormant applications.

Information on tar oil sprays on request.

*Summer Sprays:*

**ORCHARD BRAND ARSENATE OF LEAD** provides more thorough coverage through unique, flake-like particles . . . reducing insect injury to a new minimum.

**ORCHARD BRAND MICRO-SPRAY* SULFUR** A sulfur fungicide of true microscopic fineness used in the pre-bloom sprays to prevent early scab infection. In the cover sprays it protects against late scab without interfering with foliage development or finish and color of fruit. It eliminates the hazard of injury to the trees that often results from the use of lime sulfur.

**ORCHARD BRAND DRITOMIC* SULFUR** is the "old reliable" spray for controlling peach brown rot, also certain other fungous diseases on apple, peach, pear, plum and cherry.

**ORCHARD BRAND SPRAYCOP*** (Formerly "34" Copper Spray) is used instead of Bordeaux Mixture to control scab, bitter rot and blotch on apples; also cherry leaf spot, grape black rot and certain other diseases. SprayCop contains the maximum percentage of copper consistent with safety and is highly efficient at economical spray dosages.

*These and other Orchard Brand Sprays and Dusts for your particular problems. Fill in the coupon below for more complete information.*

**GENERAL CHEMICAL COMPANY**

*Executive Offices:*

**40 RECTOR STREET NEW YORK, N. Y.**

*Sales Offices:* Atlanta • Baltimore • Buffalo • Camden (N. J.) Charlotte (N. C.) • Chicago • Cleveland • Denver Houston • Kansas City • Los Angeles • Medford (Mass.) Milwaukee • Minneapolis • Montezuma (Ga.) • Pittsburgh Providence (R. I.) • San Francisco • St. Louis • Utica (N. Y.) Wenatchee (Wash.) • Yakima (Wash.) • In Canada: The Nichols Chemical Co., Ltd. • Montreal • Toronto • Vancouver

SPRAY and DUST Materials

*REG. U. S. PAT. OFF.

†TRADE MARK OF GENERAL CHEMICAL COMPANY

**GENERAL CHEMICAL COMPANY**
**40 RECTOR STREET NEW YORK, N. Y.**

Please send me full information on sprays or dusts for the following crops:

_____

_____

_____ Total Acreage _____

NAME _____

ADDRESS _____

AFG-239


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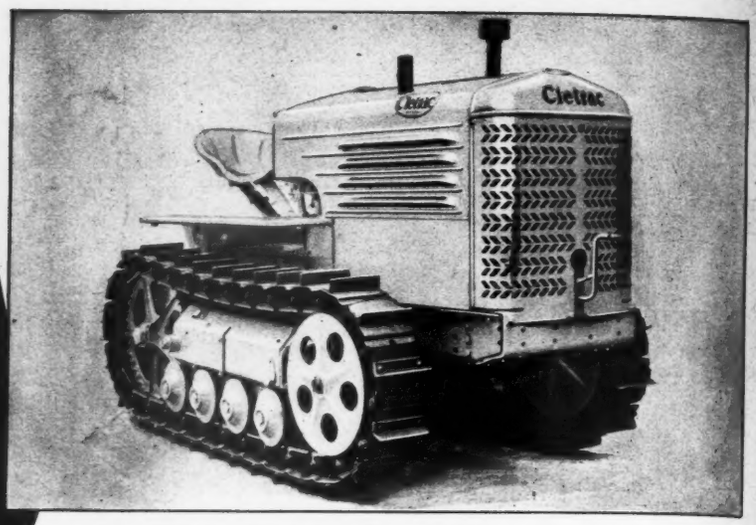
# For all your mobile power needs of 1939

# CLETRAC CRAWLER TRACTORS




**Cletrac Model E-42 Series**—With a clearance of 15 inches and a choice of gasoline or Diesel engine, this model is the ideal tractor for smaller orchards. This Cletrac has all the advantages of any larger Cletrac, including electric starting as standard on Diesel models—available on gasoline models if desired.

TO DO those jobs that take mobile power . . . easier . . . faster . . . better . . . and *on time* . . . put a Cletrac to work for you in your orchards and groves.

Cletrac is a real orchard tractor, designed from the ground up to meet the demands of fruit growers. For example, controlled differential steering is an *exclusive* Cletrac feature which keeps both tracks *always pulling* so that the operator can get close around trees with implements following exactly where he wants them.

Cletrac is fully streamlined, too, and may be equipped with fenders—there's nothing to injure low-hanging branches, blossoms or fruit.

The Cletrac owner smiles at ground conditions—he *knows* his Cletrac has ample traction in any soil and ample power for pulling a heavy spray rig, drag or cultivator.

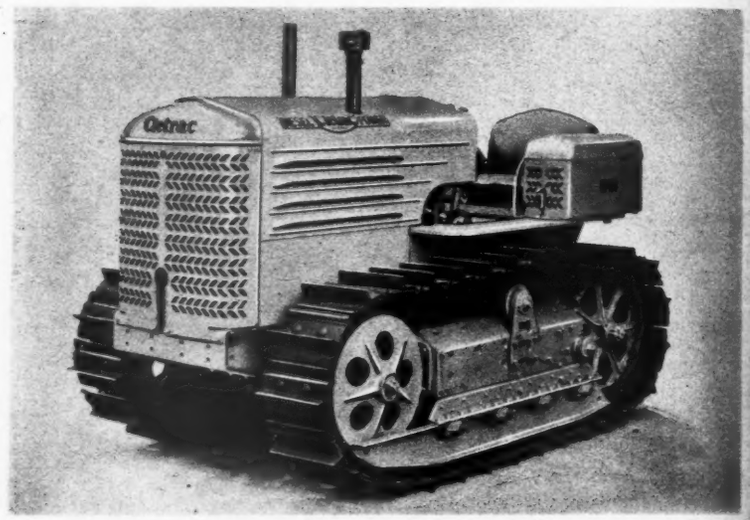
Talk with the nearest Cletrac dealer about Cletrac orchard models. If yours is a large operation you will want to consider Model A Series—a Cletrac with either a Diesel engine of 30.5 horsepower or a gasoline engine of 27 horsepower. If yours is a smaller fruit farm, Cletrac Model E42 series, with gasoline engine of 22 horsepower or Diesel engine of 25 horsepower, will meet your requirements.

And for operations of considerable size, the Cletrac Model B series, with gasoline engine of 35 horsepower, or Diesel of 37.5 horsepower, has wide acceptance among fruit growers.

Whatever your needs, match Cletrac feature for feature with any tractor of comparable size or price. *Know the difference in tractors before you spend a single one of your tractor dollars.*

**THE CLEVELAND TRACTOR CO., Cleveland, Ohio**

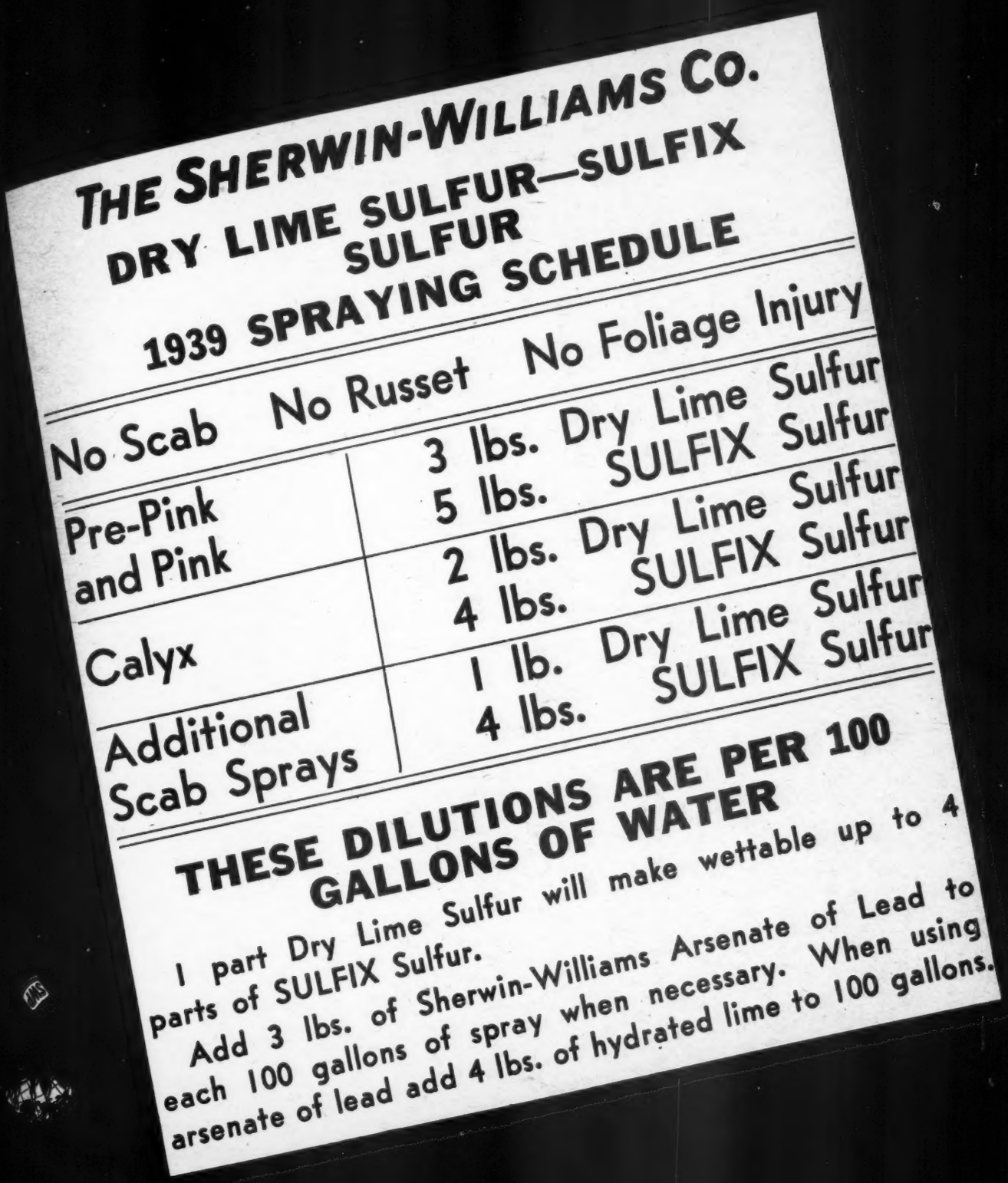
Cletrac Crawler Tractors
Built To Endure




**Cletrac Model AD**—Here is a Diesel tractor of 30.5 horsepower with a balanced design that eliminates unnecessary dead weight. With 1488 square inches of ground contact and 58 grousers, Model AD develops better than 86 per cent of its weight in drawbar pull—a mobile power unit especially suited for larger orchards.

*What's more beautiful than an orchard in bloom? But the blossoms must be sprayed at the right time—it takes a Cletrac to do timely orchard work.*

*There's no more important time in your orchard than spraying time. Cletracs have the power and traction to go anywhere at anytime with a loaded spray rig behind.*


THE SHERWIN-WILLIAMS CO.
DRY LIME SULFUR—SULFIX SULFUR
1939 SPRAYING SCHEDULE
No Scab No Russet No Foliage Injury
Pre-Pink and Pink
3 lbs. Dry Lime Sulfur
5 lbs. SULFIX Sulfur
Calyx
2 lbs. Dry Lime Sulfur
4 lbs. SULFIX Sulfur
Additional Scab Sprays
1 lb. Dry Lime Sulfur
4 lbs. SULFIX Sulfur
THESE DILUTIONS ARE PER 100 GALLONS OF WATER
1 part Dry Lime Sulfur will make wettable up to 4 parts of SULFIX Sulfur.
Add 3 lbs. of Sherwin-Williams Arsenate of Lead to each 100 gallons of spray when necessary. When using arsenate of lead add 4 lbs. of hydrated lime to 100 gallons.

# SHERWIN-WILLIAMS
## SPRAY AND DUST MATERIALS

# Get a new tractor on Goodyears!

CAN you afford a new tractor? Let's do a little figuring.

First, set down what it costs you for fuel to do a day's work with that steel-wheeled tractor.

Then take a good look at that money, because you could save just about one-fourth of it every day you run your tractor if you had a new tractor on Goodyears.

Fact is, you could save even more. With a new tractor on big, soft-rolling Goodyear tires, you could *keep your repair bills down.*

Then—to cap it all off, you could plow four acres in the time it now takes to turn over three.

Talk it over with your wife. She has an interest too. She won't have a dog-tired man dragging in to supper so late that she washes the dishes long after dark.

**NO OTHER TIRE GIVES YOU SUCH A TREAD**

We named that big husky tire you see in the picture "Sure-Grip" and it sure does live up to its name.

*It gives better grip*—because those husky rubber lugs are spaced far enough apart to bite deep.

*It's self-cleaning*—and has no pockets to pack up and cause slippage.

*It's smooth riding*—even on hard roads, because those lugs are placed at an angle so the weight rolls from one to another, giving continuous support.

**TALK IT OVER WITH YOUR IMPLEMENT DEALER**

Every day on that old tractor costs you money that could be paying for a new one on easy-riding Goodyears.

The man who can tell you all about the savings made possible by Goodyear tractor and implement tires is your implement dealer. Why not give him a chance to figure it out with you?

**Check These Advantages of Goodyear Sure-Grip Tires for Your Tractor**

**OPEN-CENTER BAR TREAD**—no pockets to pack up and cause slip; full self-cleaning; better penetration

**WIDER TREAD**—greater traction; more pull

**BETTER GRIP**—lugs are deeper cut and wider spaced to dig in without shearing off soil

**SMOOTH RIDING**—lug bars overlap evenly at center, giving continuous support on hard roads

**GREATER FLEXIBILITY**—conforms better to rough ground

**REINFORCED LUGS**—buttressed at both sides to prevent undercutting

**WEATHERPROOF RUBBER**—resists effects of sun, weather and barnyard acids

**TUNE IN!**—*Goodyear Farm Radio News N. B. C. Blue Network—Monday through Friday—1:15 P.M. E.S.T.—12:15 C.S.T.*

THE GREATEST NAME IN RUBBER

GOODYEAR

TRACTOR AND IMPLEMENT TIRES


## Nationwide News

An announcement just made by the U.S.D.A. in Washington states that the Eastern Regional Laboratory will be located at Wyndmoor, Pa., near Philadelphia. Workers in this laboratory, one of four in various sections of the country devoted to a search for new and wider industrial outlets for agricultural crops, will study apples as one phase of their research.

▼ ▼ ▼

While speaking before the eastern New York meeting at Kingston, Dr. A. J. Heinicke, Cornell University, pointed out that "the roots of fruit trees cannot function normally in absorbing water and fertilizer elements from the soil unless there is a good air supply two to four feet below the surface of the ground."

▼ ▼ ▼

In answer to a request by the Florida Citrus Commission that they feature citrus fruits in their dining cars and in every other possible way, virtually every Class One railroad in the United States and Canada has replied that it will co-operate in moving oranges, grapefruit, and tangerines.

▼ ▼ ▼

Ohio's horticulture chief, Dr. J. H. Gourley, and his co-workers have found about 1000 pounds of potash to the acre in soil 24 inches under a mulch. In an adjacent unmulched, cultivated orchard plot, there was only 175 pounds to the acre in the same soil location.

▼ ▼ ▼

Honored recently by the *Richmond* (Va.) *Times Dispatch* was Virginia entomologist Dr. W. S. Hough. He was placed on the paper's "Virginia Honor Roll of 1938" because of his conspicuous service in the formulation of a nicotine sulphate spray for codling moth control.

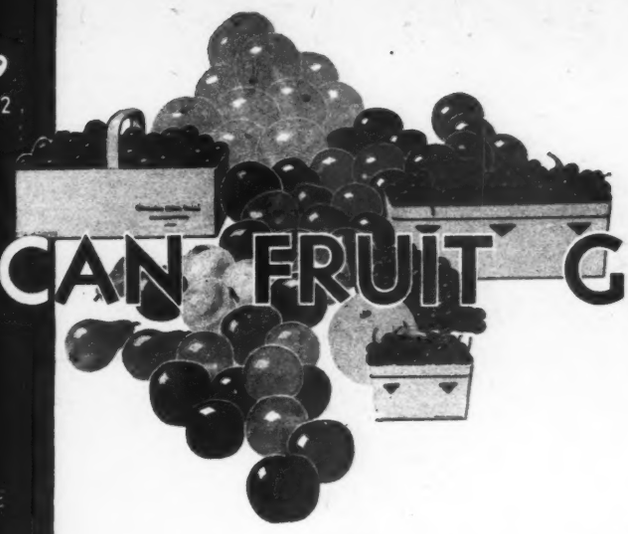
▼ ▼ ▼

After a long tenure of service as a dealer contact man and assistant advertising manager of the California Fruit Growers Exchange, Russell Eller has just been promoted to the advertising managership of the exchange. New assistant advertising manager is R. S. Simmons.

▼ ▼ ▼

Truman Nold, former sales promotion manager of the Northeast Kansas Apple Association, has recently joined the staff of Appalachian Apples, Inc., where he will be engaged in dealer service work under the direction of Secretary-Manager Carroll Miller.

FEBRUARY 1939
VOL. 59 No. 2



# AMERICAN FRUIT GROWER

*The* NATIONAL FRUIT MAGAZINE

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*Cover illustration courtesy E. I. du Pont de Nemours & Company, Inc., Grasselli Chemicals Department.*

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## The Apple of HEALTH

By DR. IRA A. MANVILLE
Oregon School of Medicine

**OUR observations show that the American diet is changing. At first, the human dietary was largely controlled by circumstances. In frontier areas the diet was more or less made up of fish, fowl, or game, products of the stream, forest, and field, easily obtainable. Most of the time was devoted to clearing land, setting out orchards and cultivating the gardens. The success of this work introduced into the diet an increasing portion of cereals and foods made from cereals.**

**Within our generation a new tendency has developed; that of extracting from raw materials pure starches, fats, sugars, and oils. The dietary has, therefore, decreased in bulk, but increased in caloric or energy values.**

**Today, great emphasis is being placed on protective foods, largely made up of dairy products, fruits, and vegetables. Fruits and vegetables provide many of the necessary vitamins and, in addition, dependence must be placed on the bulkiness in these foods for normal intestinal activity. Apple pulp contains nothing that is friction-producing. On the contrary, it contains materials that are capable of taking up and holding water. This produces a bland, non-irritating, bulky material that provides a normal stimulus for intestinal action.**

**Apples contain varying amounts of vitamin A according to the variety, some of them as high as 36 Sherman units per ounce. It is certainly true that animals deprived of vitamin A show degenerative changes in the mucous membrane lining of the nose, throat, and elsewhere. So if maintaining a healthy mucous membrane is protection against colds, then the vitamin A found in apples is protective in this respect.**

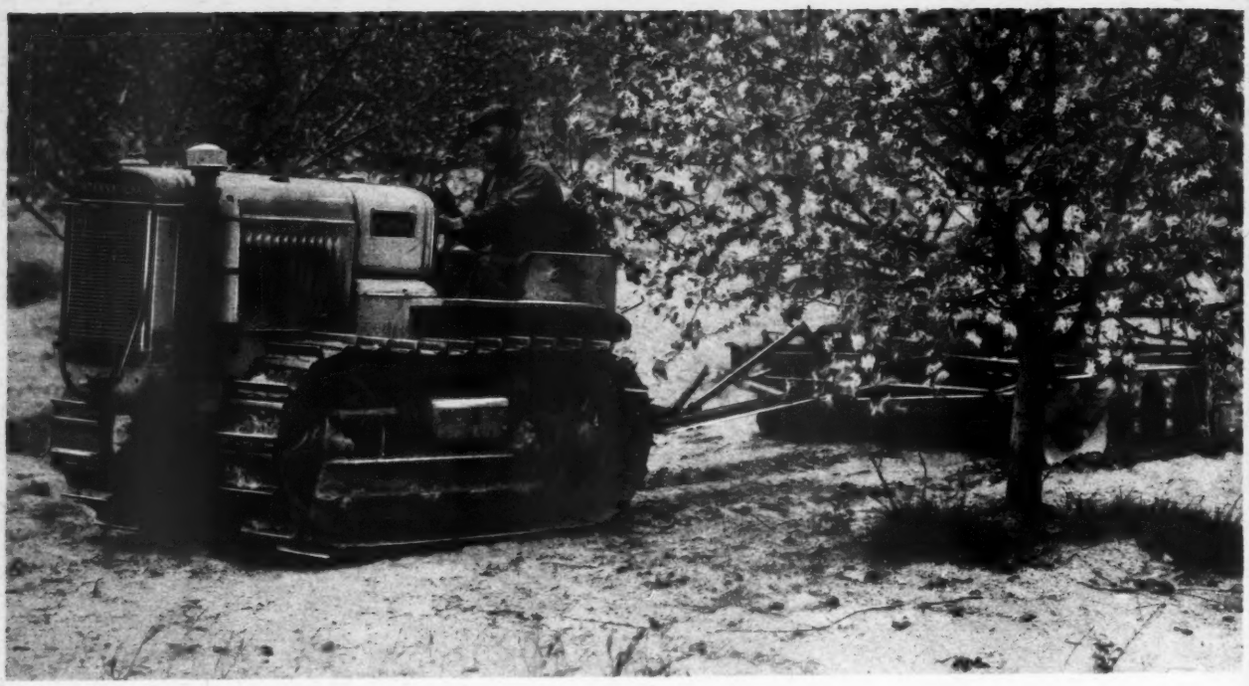
**The apple contains vitamin C and probably some of the other vitamins but the latter have not been determined scientifically. It is well-known that vitamin C prevents and cures scurvy, but a still more interesting function of this vitamin is the effect that it is believed to have in overcoming body poisons. Other apple substances, closely related to sugars, also seem to produce this effect.**

**I cannot help but feel from the results of our work and of other investigators that when the average American citizen includes in his diet from one to one and a half to two pounds of fruits and vegetables that many of the illnesses with which he is afflicted will disappear. In terms of apples, this would amount to four to six individual fruits.**

**In the apple, nature has prepared for us the most compact package of health-giving food that we possess.**

# If It's a Job for Crawler Power It's a Job for an

# INTERNATIONAL TRACTRACTOR



The Model T-20 TracTracTor—an ideal crawler for working in the orchard. It makes short turns easily, handles smoothly between rows of trees.

Wherever there is a need for sure-footed, economical crawler tractor power, you'll find International TracTracTors making a splendid showing.

TracTracTor performance is a result of many superior features: exceptional drawbar power; a large number of antifriction ball bearings; ease of control; special dirtproof and waterproof seals protecting working parts; and many others. Then, from the service standpoint, the accessibility of steering brakes, steering clutches and other units is a big advantage.

International Harvester offers you a choice of five TracTracTor models. You can select the right size for your own work. The Model T-20 is a favorite with fruit growers. Stepping up to the larger sizes, the Models T-35, T-40, TD-35, and TD-40 (the last two are DIESELS) have ample power and stamina for heavy-duty work.

Talk to the International Harvester dealer in your locality about TracTracTor performance. Go over the specifications. Get the full story about power ratings, engine speeds, drawbar adjustments, fuel economy, etc., and then *decide for yourself.*

**INTERNATIONAL HARVESTER COMPANY**

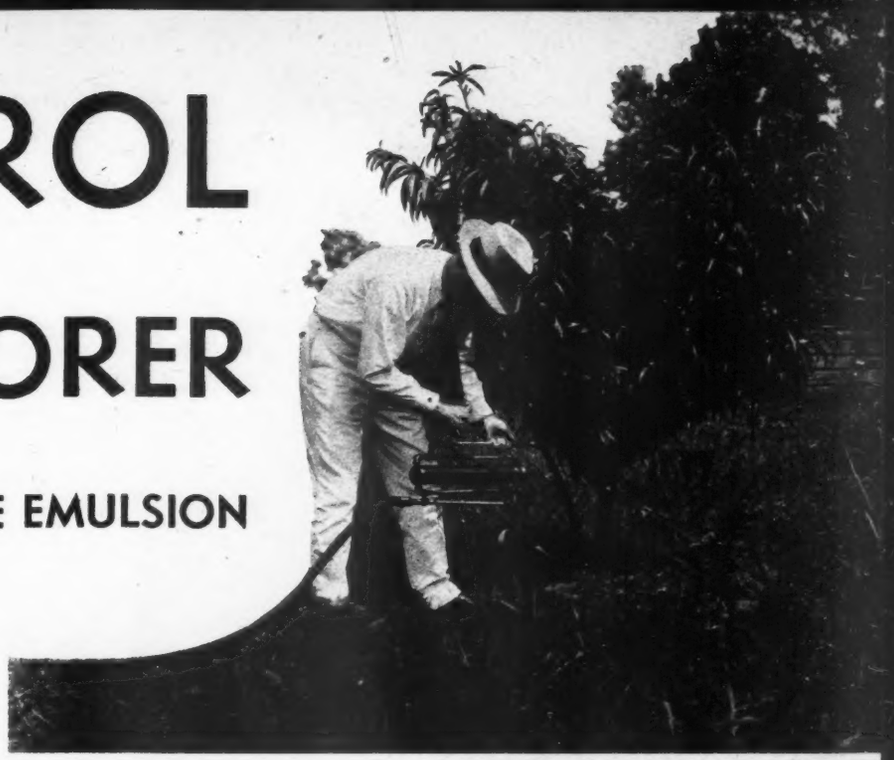
*(Incorporated)*

**180 North Michigan Avenue** **Chicago, Illinois**

# INTERNATIONAL

## TRACTRACTORS

# CONTROL *of the* PEACH BORER *with* ETHYLENE DICHLORIDE EMULSION



By OLIVER I. SNAPP
U.S.D.A., Ft. Valley, Ga.

RESULTS of experiments conducted in Georgia, New York, and Illinois have shown that ethylene dichloride emulsion has a number of advantages over paradichlorobenzene for the control of the peach borer.

These investigations were carried on from 1933 to 1937 in central Georgia with the assistance of J. R. Thomson, Jr. In 1937 they were broadened to include co-operative experiments in southern Illinois and western New York. In Illinois the experiments were made in co-operation with W. P. Flint and S. C. Chandler of the Illinois Natural History Survey and the Illinois Agricultural Experiment Station; in New York the work was carried on co-operatively with P. J. Parrott, D. M. Daniel, and James E. Dewey of the New York Agricultural Experiment Station.

Ethylene dichloride emulsion is effective at low soil temperatures and therefore can be used late in the fall and early in the spring, when it is too cold for paradichlorobenzene to be effective. The material has also given good borer control during midwinter in Georgia. It appears to be safer on young trees, as well as being more quickly and completely effective than paradichlorobenzene. Furthermore, the ethylene dichloride treatment requires a minimum of preparation of the soil before treatment and no attention subsequent to mounding after treatment. Just as good results are obtained by pouring it around the trees as by the use of a sprayer. The cost is a little less than that of paradichlorobenzene.

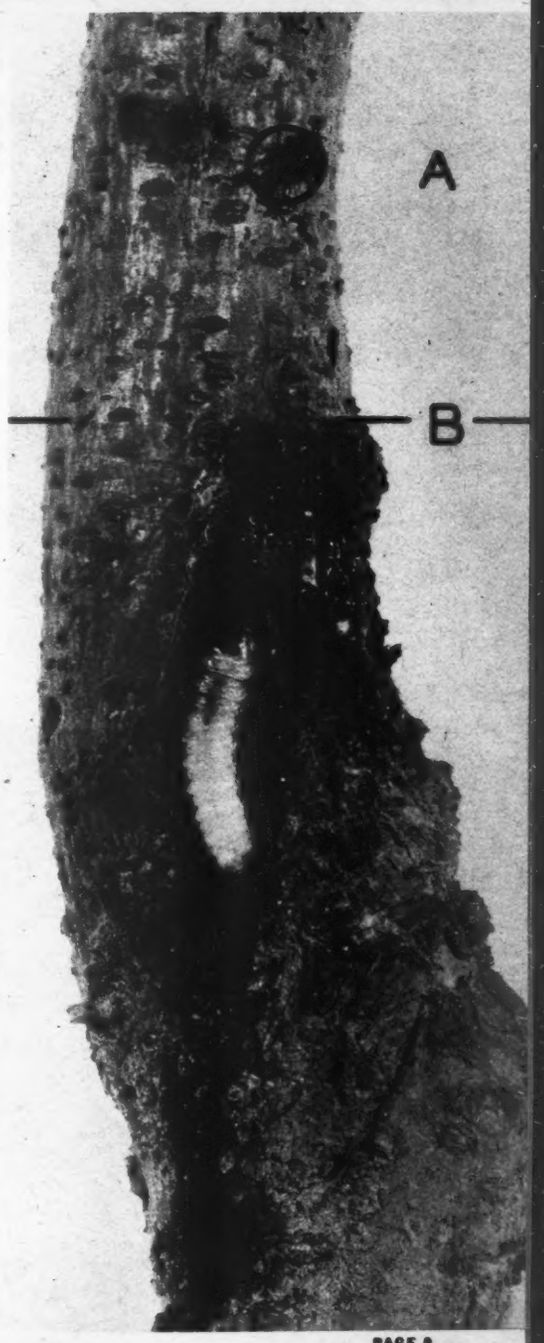
Ethylene dichloride is a colorless liquid with an odor like chloroform. When the vapor is inhaled it has an anesthetic action, although less rapid than that of chloroform. Unless breathed in high concentrations over a long period of time, no harmful results may be feared in working with it.

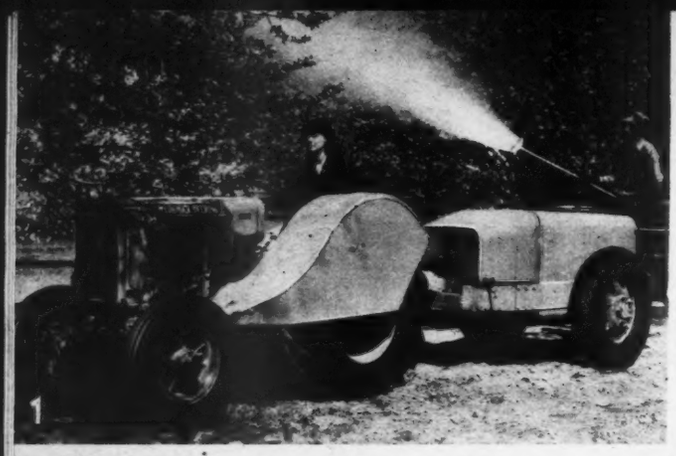
*(Continued on page 22)*

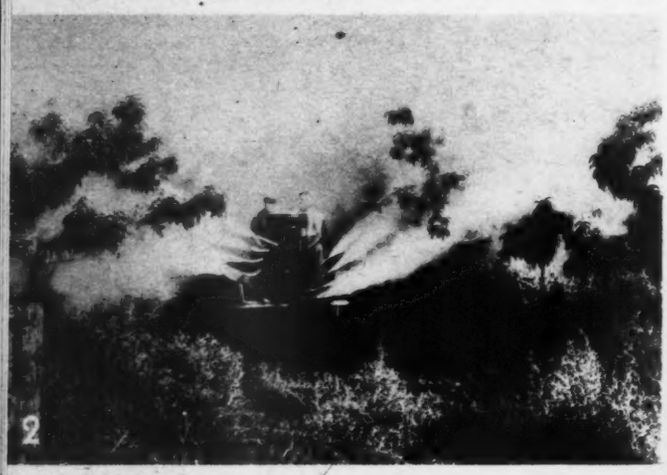
**Above—Regulatory device perfected by Dr. O. I. Snapp and his co-workers which controls the amount of solution for each tree.**

**Right—To make this remarkable photo, New York Experiment Station workers removed bark at base of two-year-old peach tree showing tunnel of mature borer. A—New entrance of young borer. B—Ground level.**

**Below—Adult of the peach tree borer resting on leaf. Slightly marked clear wings and striped body distinguish this insect.**







# 1939 SPRAY ARMY WILL MARCH INTO BATTLE WH

By DEAN HALLIDAY

● 1776 saw the minute men stride resolutely through field and orchard to defeat the enemy.

1939 will soon see another army march grimly into the commercial orchards of the country to battle a host of enemies.

These modern minute men are the fruit growers and their crews of spraymen and dusters. The enemies they must meet and defeat are the hordes of insects that annually threaten the industry.

The minute men of '76 went into battle with hastily caught up muskets and squirrel rifles.

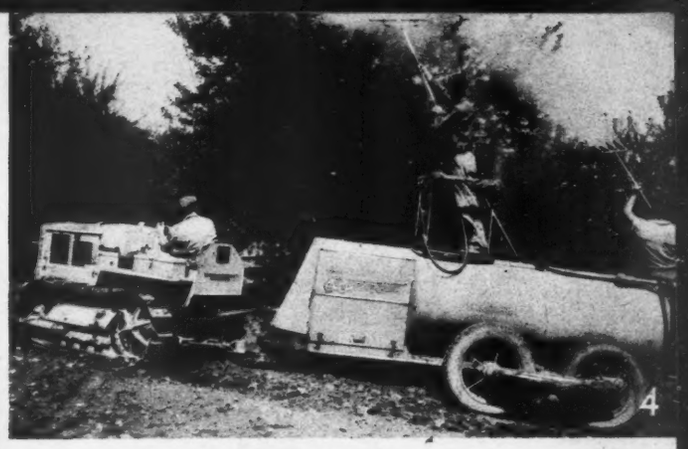
The minute men of today will meet the enemy with the newest mechanical equipment. They will be armed with high-powered, streamlined, motorized sprayers and dusters capable of engulfing millions of insect pests in swirling clouds of death-dealing sprays and dusts.

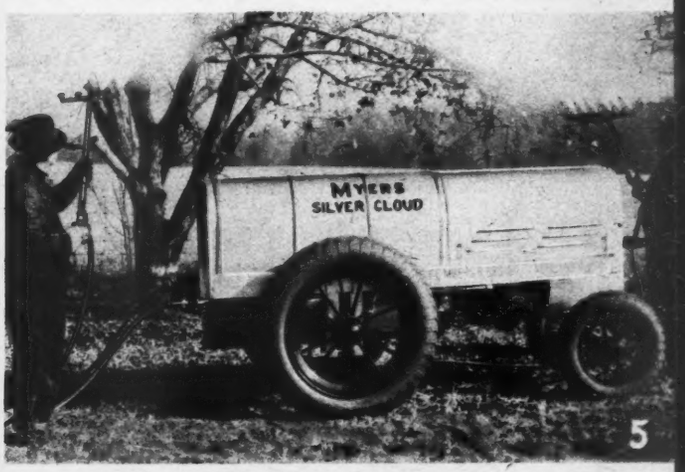
This 1939 spray army will be so vast, so well organized, and so efficiently equipped that it is estimated upwards of 250,000 spray rigs and dusting machines, tractors and trucks will roll into action when the annual attack begins. The value of this mechanical equipment alone is conservatively placed at a quarter of a billion dollars.

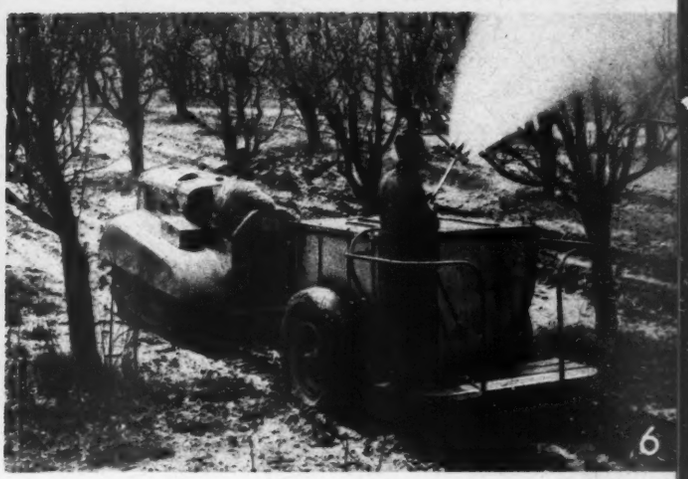
Like all modern armies, the 1939 spray army will make careful preparation for the approach of the zero hour. Trained corps of spraymen will be organized and outfitted from head to foot with helmets, goggles, rubberized spray suits, gloves, and rubber boots.

The army's experts will check all mechanical equipment, spray tanks and rigs, dusting machines, trucks and tractors. Each unit will be cleaned, overhauled, tested and retested for perfect, precision operation. Orders for needed new, high-powered, latest design units will be dispatched. Millions of pounds of spray and dust materials will be purchased and held in readiness as ammunition supplies.

As the hour for the army to move into action approaches, thermometer and barometer readings will be noted, weather reports will be studied, and special radio bulletins on spraying and dusting conditions will be picked up. Then, when everything is in read-





# LE WH NEWEST, MODERN HIGH-POWERED EQUIPMENT

iness, the great war of extermination will begin—a concerted, countrywide series of battles to protect the fruit crops of America from the annual invasion of horde after horde, and brood after brood, of insect pests.

To compare the highly organized, highly mechanized spraying and dusting operations in orchards today with the barrel, hand pump, hose, and bamboo-supported nozzle of yesteryear, is to compare the progress of the industry itself from the farm-orchard of pioneer days to the billion dollar business into which commercial fruit growing in this country has developed.

It is true that the problem of pest control is greater today than it was in pioneer days. It is equally true, however, that with necessity as the mother of invention, progressive manufacturers have so improved the design and effectiveness of present day spraying and dusting machines that there is now available to equally progressive growers just the right type and size of outfit to provide maximum protection against insect pests at minimum cost.

Manufacturers of spray and dust materials have also improved and

*(Continued on page 35)*

**1** From the built-on rear platform of his power take-off rig, this 1939 "minute man" of orchard pest control trains his multiple nozzle broom on highly destructive enemies.

**2** So complete is the haze released from this duster, that operators are all but invisible. Higher velocity and greater uniformity in feeds permits this performance by new dusters.

**3** Not content to be nothing more than a driver, the tractor operator of this spray "team" does his bit to produce a better spray job with a modern power take-off spray rig.

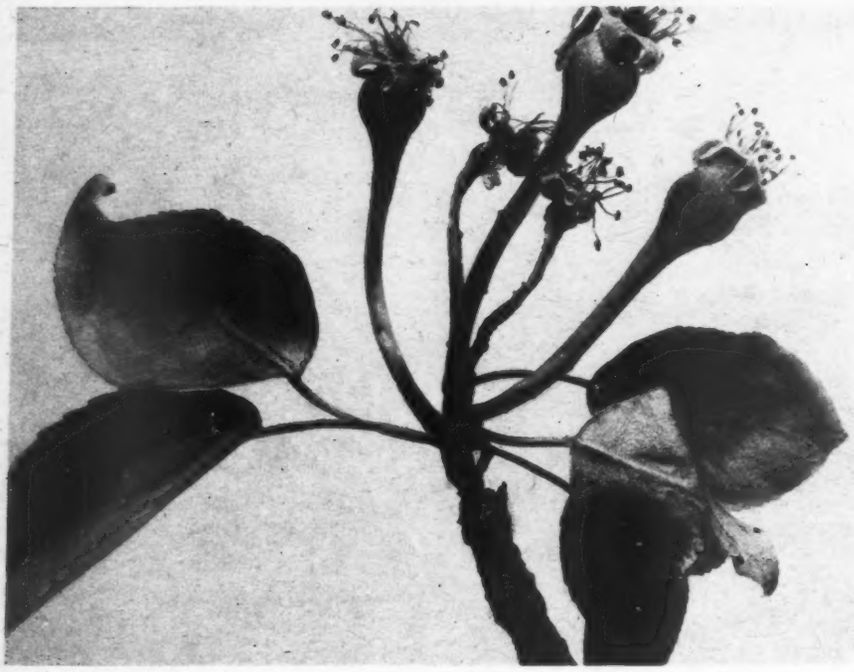
**4** Looking large enough to handle spray solutions to last a day, this tandem rig is fitted for power take-off and tanden arrangement of wheels allows straddling of ditches.

**5** Complete enclosure of engine and pump is the modern sprayer design trend. This unit, fitted with rubber tires and compartment hood, reflects progress achieved in new sprayers.

**6** Where the delayed-dormant spray used to be a series of mired rigs, the heavily loaded outfit equipped with truck-type tires now travels the softest mud without difficulty.

# FIGHTING FIRE BLIGHT IN APPLE AND PEAR WITH 2-6-100 BORDEAUX

By MONROE McCOWN
Purdue University Agricultural Extension



Above—Infected pear flower. Note drop of bacterial ooze at the base of the blackened area on the pedicel. This ooze, teeming with bacteria, is the source of infection for secondary spread of the disease.

Left—Pear cluster infected by fire blight. The two withered flowers became infected following initial spread of bacteria to the cluster. The bacteria progressed down the pedicels of these flowers into the cluster base, from whence the bacterial mass is moving up the pedicels of the other three fruits, killing entire cluster.

MORE than 30 years ago the results of a test in Delaware showed that Bordeaux spray applied to blossoming pear trees reduced infection by fire blight. Later work in Illinois and Oregon gave similar results. Unfortunately, strong Bordeaux (6-12-100 or stronger mixtures) was used in these earlier tests and the pear fruits were russeted. Because of this injury to the fruits the tests were discontinued and the use of Bordeaux sprays during the blossoming period was discouraged. The results of more recent studies conducted in Indiana and other states show, however, that a weaker Bordeaux can reduce loss from fire blight without causing serious injury to the fruit.

Studies were initiated in Indiana by the writer in 1927 to determine (1) whether 2-6-100 Bordeaux (two pounds copper sulphate, six pounds hydrated lime, 100 gallons water) was sufficiently strong to prevent infection by fire blight in flowers of apple and pear, and (2) whether this strength of the mixture was weak enough to eliminate the danger of russeting of the fruit.

In laboratory tests, the fire blight bacteria were killed after short exposure to the Bordeaux. In orchard tests, the number of flower clusters that blighted, either as the result of natural spread of the organism or artificial inoculation with heavy suspensions of the bacteria, was reduced very materially by spraying with the weak Bordeaux. In commercial orchards located in different sections of Indiana the number of naturally infected flower clusters was reduced an average of 63 per cent in three tests with Jonathan apple, and 98 per cent in one test with Seckel pear. In six tests in which Grimes Golden apple flowers were inoculated with heavy suspensions of the bacteria in distilled water after the clusters had been sprayed with 2-6-100 Bordeaux, the number of clusters which became infected was reduced an average of 52 per cent as the result of the application of the spray.

During the course of these tests, mature fruits which developed from sprayed flowers were compared with those from unsprayed clusters. No serious russeting which could be attributed to the use of the spray was observed. The results of additional observations which were made from time to time in commercial orchards in Indiana support the earlier conclusion that russeting did not follow the use of 2-6-100 Bordeaux during the early part of the blossoming period.

Although the results of the tests reported above showed that fire blight infection was reduced by the use of weak Bordeaux, some growers hesitated to apply the spray fearing that the set of fruit might be reduced. While no reduction in fruit set had been observed in these tests, no comprehensive check had been made.

In 1935 and 1936, L. J. Doud, horticultural student at Purdue University, studied the effect upon set of fruit of the application of 2-6-100 Bordeaux to Grimes Golden apple flowers. All clusters were thinned to an equal number of flowers, only freshly opened flowers being left for the test. Each flower was thoroughly coated with spray. Under such severe treatment, which would not be duplicated in commercial orchard practice unless the trees were sprayed at intervals of one to two days throughout the blossoming period, the set of fruit was reduced an average of about one-fourth for the two seasons.

*(Continued on page 28)*

# CODLING MOTH CONTROL for 1939

By W. P. FLINT
Illinois Agricultural Experiment Station

Removing brush from the orchard, thus eliminating codling moth hibernation quarters, an important supplementary measure in codling moth control.

STYLES in codling moth control change but we still have wormy apples. While the foregoing statement is true, the wormy apples in our orchards will depend on several factors that are largely under our control. The three most important of these are:

1. The type of control we use.
2. When we use it.
3. Most important, how well we use it.

None of us will deny that we could pick a list of 10 orchardists who could take any one of the three best known methods of codling moth control, put them in practice, and get from 90 to 98 per cent clean apples. Neither could we deny that we could select another list of 10 orchardists who would take the same methods of control, put them in effect in their orchards, and the result would be fruit that was far from 90 per cent clean. In these cases success or failure would not depend so much on the methods as on how thoroughly and intelligently they were carried out with reference to the orchard in question.

During the past five years there have been some changes in materials used for codling moth spraying. This period has seen a very determined attempt to find a substitute for lead arsenate. The success of this attempt has been limited. Of the materials that have come in and proved of some value, we could mention only two or three:

*Phenothiazine*, a material suggested for use by the Federal Bureau of Entomology and Plant Quarantine. This material has been tried by a number of the experiment stations in the East and also to a limited extent by orchardists. The results in the eastern section of the country have been uniformly poor. The material is quite soluble in water and in regions where rainfalls are frequent and rather heavy, it has not given satisfactory control. In some of the more arid sections of the West, it has given much better results.

*Cryolite* is another material that has been tested rather thoroughly during this period. Here we have a material that is probably equal to lead arsenate so far as actual toxicity to codling moth is concerned. It does not, however, have the adhering qualities of lead arsenate.

The most important of the new spray materials has resulted from the improvement in one of the older and well-established materials, *nicotine*. This improvement has been in "fixing" the nicotine so that it volatilizes very slowly and acts on the codling moth more as a stomach poison than as a contact poison. These new forms of fixed nicotine now being put out by several different companies under a number of trade names or brands are very definitely finding a place in our codling moth control work. Many growers find it undesirable for one reason or another to wash their fruit and to these the fixed nicotine compounds have proved of very distinct value. Fixed nicotines have given us a really new weapon with which to fight the codling moth and one that has several advantages not possessed by lead arsenate.

First among these is the fact that the fixed nicotines do not form compounds that are injurious to either the fruit or foliage. Most of the commercial forms of fixed nicotine now on the market leave residues on the fruit which are scarcely visible and which are non-poisonous. Although in the fixed nicotines volatile nicotine is greatly reduced, they still retain a high toxicity to some of the secondary orchard insects, and where they are used in the regular orchard spray schedule can be depended upon to give satisfactory commercial control of leafhoppers and to a considerable extent to keep down any forms of aphids which become abundant in the orchard during the growing season.

Some of the disadvantages of the fixed nicotine are:

1. They cannot be readily combined with any of the better-known fungicides without distinctly reducing the toxicity of the nicotine compounds.
2. They do not retain their toxicity over as long a period as is the case with lead arsenate. In other words, if you will use a fixed nicotine schedule, more sprays will be necessary with a shorter interval between the applications.
3. They are higher in price.

Another new and relatively important development in codling moth control is the working out of a schedule in which nicotine in the form of nicotine sulphate is used in the three peak sprays for control of first brood codling moth. That is, these applications should be made at the time when the adult moths of the first brood are more abundant in the orchard. This method of codling moth control which was largely originated by Dr. Hough in Virginia, and further developed during the past two years by Dr. Driggers in New Jersey, seems to offer a new mode of codling moth attack which is distinctly worth considering.

In this method one pint of nicotine sulphate to each 100 gallons of spray solution is added to the first three cover sprays following the calyx ap-

*(Continued on page 31)*

# WAR NEWS!

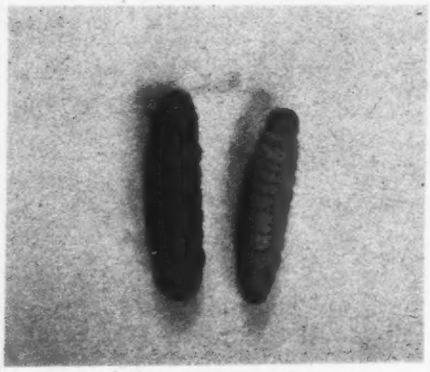
Start of life cycle of No. 1 enemy of the peach, the oriental fruit moth. These are egg masses of the insect on a leaf.

# INSECT ARMIES MAKING STEADY GAINS IN DRIVE AGAINST ORIENTAL FRUIT MOTH

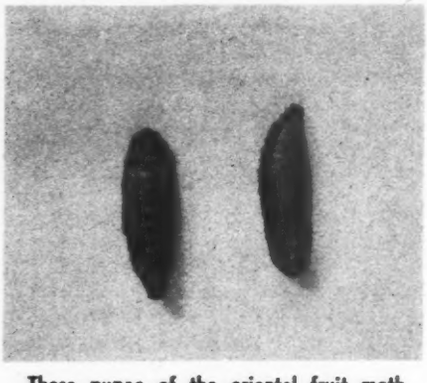
NO response of growers to a damaging orchard condition was ever more graphically displayed than at the recent Indiana Horticultural Society meeting. Purdue University's Prof. J. J. Davis had just finished his summary of oriental fruit moth parasite liberation and subsequent moth damage curtailment in the areas where the parasites were released. Several growers, particularly those in whose orchards the parasites had brought relief from an almost hopeless situation, were quick to ask him for continued work with the parasites. So acute is their problem that they wanted to band together, if necessary, to finance the maintenance of an entomologist and laboratory in their own locality.

A decision as to future action was not reached at the meeting, but this reaction by growers portrays the status of the oriental fruit moth. So far, this pest has been only partially controlled by sprays and, more recently, by dusts. Parasitism is now established as a more positive check on its harmful action. The results of parasite release in Indiana is a reflection of the experiences of entomologists and growers in all sections of the country. Dr. D. M. Daniel, in a recent issue of New York station's *Farm Research,* sums up the Empire State parasite liberation work and control results. This story of a successful struggle against a fruit pest with the strategy of biological methods is digested in the following discussion.

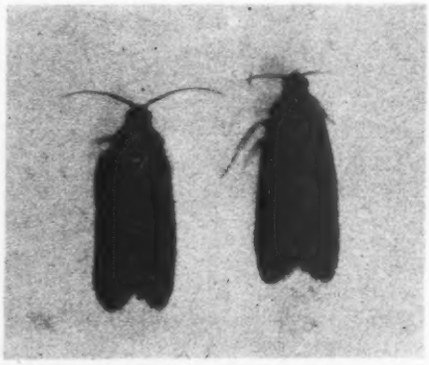
In view of the continued failure to discover a satisfactory control measure for the oriental fruit moth, it was believed that the biological method of control was the most hopeful undertaking. Accordingly, it was decided to attempt the importation and establishment of promising parasitic insects. Southern New Jersey, at that time, showed high



Control of this pest is difficult because larvae like those above do not eat portions of fruit they bite off in making entrance and often enter through twigs.



These pupae of the oriental fruit moth represent the intermediate stage between the larvae and the mature moths.



Although slightly smaller, the adults of this pest closely resemble codling moth adults. Eggs are laid on leaves and twigs.

parasitism with one species, *Macrocentrus ancylivorus,* responsible for over 90 per cent of the recorded parasitism. The desirability of determining the possibility of establishing this parasite in New York seemed obvious. With the aid of funds made available by the Department of Agriculture and Markets, importations were begun in 1928.

Throughout 1928, the fruit moth was restricted to a small area in Niagara County, but it was increasing and spreading rapidly. Alarmed growers in this area were instrumental in securing an appropriation for work against the pest in 1929. Importations of the parasite were continued in 1929, 1930, and 1931. In 1931, additional funds were made available and the rearing of *Macrocentrus* in the laboratory at Geneva was begun. This laboratory rearing has been continued to the present time and about 600 colonies have been liberated. About 80 per cent of these were released in western New York and the remainder in the eastern part of the State. In addition, a score or more species of foreign parasites have been distributed over the entire State in some 150 colonies in co-operation with the U. S. Bureau of Entomology and Plant Quarantine.

In 1928, the fruit moth was just coming into prominence as a peach pest in Niagara County. The infestation was limited to a narrow strip along the Niagara River. Parasites were established in two orchards in that area. During 1929, the moth spread eastward over the rest of the county, although injury was severe only along the river. Four more orchards received parasites during the year. Fruit counts were made only in the area where the parasites had been liberated. The number of parasites liberated was so

*(Continued on page 32)*

# HOW TEXAS PRODUCES CLEAN CITRUS FRUIT

By J. F. ROSBOROUGH

Extension Horticulturist
Texas A. & M. College

A 1500-acre citrus orchard near Elsa, Texas, in the Rio Grande Valley. A thorough program of spraying and dusting keeps trees and golden fruit in this and other Texas citrus orchards free of insect pests.

THE rapidity with which insects appear and begin their devastations upon plants has always been a matter of great interest and likewise a matter of great economic concern. A comparatively few years ago (1912) the first Texas citrus fruit orchard was planted. The lands on which the plantings were made were for the most part carved out of a subtropical wilderness of mesquite trees and native underbrush. Few, if any, of the native trees and plants which made up the native forest served as hosts for citrus insects. Yet within five years after the first plantings had been made, many of the orchards were literally covered with insects.

It would be a tiresome story to tell about the many insects, how and when they first appeared in Texas, and how much they have cost the grove owners. I am sure that you appreciate the fact, however, that growers have gone about the production of clean fruit in such a way as to stem the onslaught of any and all insect marauders.

After Texas citrus orchard owners had begun to ship luscious grapefruit and oranges to eastern markets, there appeared a special insect which threatened the future of the industry. This pest, known as the Mexican fruit fly, can be detected only after the larvae (worm stage) have attained considerable size. The first external evidence of the presence of a maggot in the fruit is a slight discoloration on the skin. It is difficult to definitely determine wormy fruit before it is harvested. Infested fruit might easily pass unnoticed through packing houses and be placed on the table before the presence of a maggot is noted. It is easy to see how fruit coming from an area producing fruit of this type would be discriminated against.

The Division of Plant Quarantine of the U.S.D.A. came into the picture soon after this pest was discovered. Since that time, under the leadership of Dr. Paul Hoidel and a group of efficient assistants, the Mexican fruit fly has been kept under complete control. Members of the inspection service not only check citrus orchards and packing sheds, but also guard against the entrance of this pest on the international bridges along the Rio Grande River. No citrus fruit or other fruits on which the Mexican fruit fly can exist is allowed to cross the Mexican border.

In the life cycle of the Mexican fruit fly, the worm stage occurs in the fruit during the winter season. In the early spring it pupates and hatches into a fly. In order to still further guard against this pest, citrus growers remove and destroy all ripe fruit from the trees by the first of April each spring. By co-operating in this work citrus fruit growers have won a decisive battle.

The most common insects in Texas citrus orchards are red scale, rust mite, and red spider. On young trees fire ants frequently cause heavy losses.

*Red Scale.* This particular type of scale is more serious than any other species of scale. Yellowing of the foliage, defoliation, and dropping of

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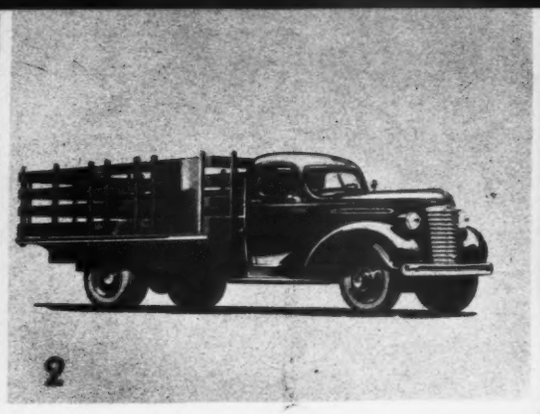
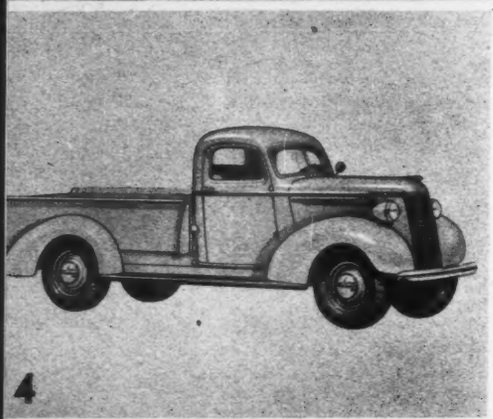


# NEW TRUCKS TO KEEP YOUR BUSINESS MOVING

Famed saying of a veteran horticulturist is, "There are no two fruit farms alike." But, factually, all fruit farms are alike when the place of the motor truck in their operations is considered. From orchard or grove to market outlet, the motor truck is an essential of the fruit industry. Successful growers find that prompt handling of crops is key to profitable fruit production.



**1** International's high-stake body model is a type enjoying much popularity among fruit growers for it permits many uses.

**2** Larger, sturdier bodies and larger cab feature this new General Motors Truck unit. New Diesels are included in this line.

**3** This Ford V-8 is a handy orchard utility type. Like other Ford models, this type boasts a variety of fruit farm uses.

**4** Truck of a thousand fruit farm uses might aptly describe this Chevrolet pickup; hauling, from fruit to fertilizers, included.

**5** Said to be engineered for hard work and heavy hauling, this Dodge one and a half-ton stake truck has a 160-inch wheelbase.

**6** Available in one-half and three-quarter ton, this Hudson Big Boy cab model pickup has a maximum load capacity of 45 cubic feet.

**7** Loaded, but just ready to unload after a trip to the terminal market, this Diamond T shows use of maximum load space.

**8** Studebaker's two-ton, open-body model features over-all streamlining. Makers stress economy of operation and upkeep.

**9** Truck-type frame and bigger load space are points which feature this 1939 Plymouth pickup model. Wheelbase is 116 inches.

**10** Specially constructed for use in California citrus groves, this White truck prevents tree injury when moving fruit.

**11** This cab-over-engine Mack with attached trailer permits hauling larger quantities of fruit from orchard to packing house.

**12** One of the Federal cab-over-engine line, this two to three and a half ton model has a 16-foot deluxe stake body, regular cab.

# America's Apple Crop

## PROFITS BY THE USE OF "BLACK LEAF 40"

**Dessert-quality fruit—free from blemishes—must be protected against Aphis, Red-Bug, Leafhopper, and Codling Moth injury. "Black Leaf 40" effectively assists in protecting both fruit and foliage. It helps you produce the apples America buys readily—dessert-quality. • "Black Leaf 40" is concentrated, easy and economical to use. Its effectiveness and safety to buds and foliage have been demonstrated in thousands of orchards during the last twenty-eight years. "Black Leaf 40" is sold by spray material dealers everywhere.**

*Look for the Leaf on the Package!*

**TOBACCO BY-PRODUCTS & CHEMICAL CORPORATION**
**INCORPORATED** — **LOUISVILLE, KY.**

"Black Leaf 40"

3921

# APS

A PAGE CONDUCTED IN THE INTERESTS OF THE AMERICAN POMOLOGICAL SOCIETY

## FOUR-FOLD BENEFITS FROM UPWARD REVISION OF RESIDUE TOLERANCE

THE report of the activities and findings of the Committee on Spray Residue Research as given at the Chattanooga meeting of the American Pomological Society and the Tennessee State Horticultural Society was one of considerable significance. This committee consists of W. A. Ruth, Urbana, Ill.; F. L. Overley, Wenatchee, Wash.; J. H. Gourley, Columbus, Ohio; T. J. Talbert, Columbia, Mo., and H. R. Kraybill, Lafayette, Ind. The report of the committee is too long to permit printing in full here, but parts of the report will be of interest to fruit growers who wish to be advised as to the events leading up to the upward revision of the lead tolerance on September 20, 1938. The committee's report was as follows:

"As the result of an act of Congress appropriating $50,000 a year for this purpose, the United States Public Health Service, in the fall of 1937, started an investigation of the nature and extent of the possible hazards resulting from the use of lead arsenate as an insecticide on apples. In interesting the Public Health Service in this project and in securing the appropriation, officials of the American Pomological Society took the initiative. When the appropriation was made it became necessary, in order to avoid possible duplication, to discontinue the appropriation of funds appropriated to the United States Department of Agriculture for the same purpose. Such funds had been applied by the Department of Agriculture to an experiment started within the Food and Drug Administration in 1936.

"The latter division of the government had limited its work to laboratory experiments with small animals. The Public Health Service experiment, on the other hand, was outlined and carried on in an entirely different manner. It approached the problem at hand directly through the investigation of actual hazards as they might exist in the fruit growing industry and among consumers of heavily sprayed apples, supplementing this work with experiments in the laboratory, using human subjects. The Public Health Service asked for and secured the co-operation of the fruit growing industry, thereby following a policy which it pursues in all industrial investigations. A description of the experiment, prepared for this report by Dr. R. R. Sayers, Chief of the Division of Industrial Hygiene, United States Public Health Service, follows:

" 'As you know, in the fall of 1937, a survey was made of the United States in order to determine where the epidemiological portion of this study could best be undertaken. Broadly speaking, the method of study was to make concurrently (1) a clinical appraisal of individuals employed in the apply growing industry as well as a representative number of consumers of apples, (2) an evaluation of the working environment of orchardists and employees in the industry, and (3) to collect samples of blood and urine on orchardists and consumers for chemical determination of lead and arsenic content. These clinical, environmental, and chemical findings were to be correlated in order to determine, if possible, the effect of long-continued lead arsenate intake in the human body.

" 'Medical examinations were planned on sizable groups of orchardists and non-orchardists. Each subject was to be given an initial medical examination and two re-examinations. For the orchardists, the first examination was planned to come before the beginning of the spraying season, the first re-examination to come at the peak of the spraying season, and the second re-examination a month or so after the spraying season. For non-orchardists, whose principal exposure to lead arsenate is eating of apples and pears to which spray residues adhere, the first examination was planned to come in the summer season after the previous year's stock of apples had been used up and before the new crop came in; the first re-examination in the late fall and early winter; and the second re-examination in the spring. Thus, each person would be examined at the beginning, at the peak, and near the end of his exposure to lead arsenate.

" 'At this time, over 1100 individuals have been given their first medical examination; about 200 have had their first re-examination; and approximately 75 had had the second medical re-examination. The examinations are still in progress and it is thought that this study will be continued in Wenatchee for a few more months in order to complete their cycle of exposure.

" 'In addition to this epidemiologic-

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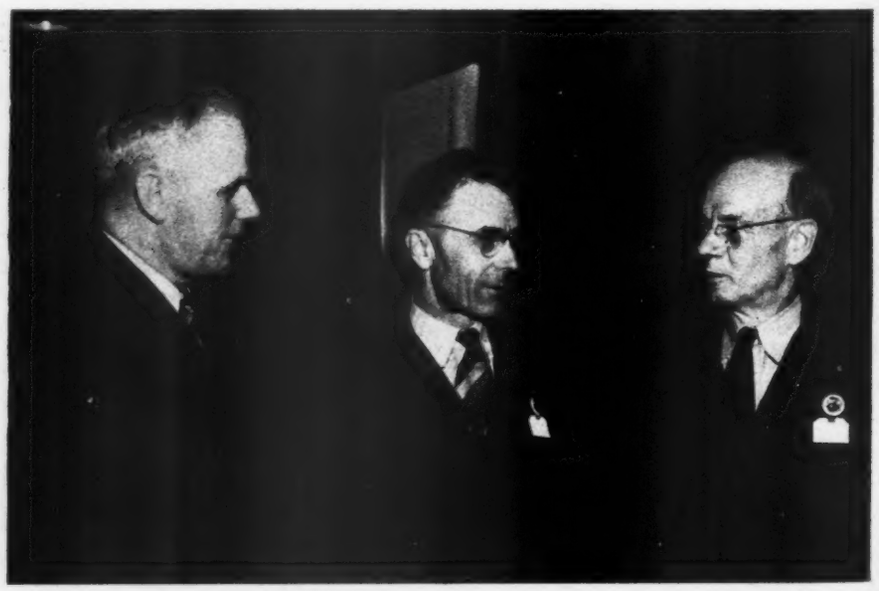


**Dr. W. A. Ruth (right) of the University of Illinois and prominent leader of the APS Committee on Spray Residue Research, is questioned after his residue situation talk at Illinois meeting by Fred Hawkins, Texico (center), and Dr. V. W. Kelley, Illinois extension horticulturist.**

# TO REPAIR OR NOT TO REPAIR —THAT IS THE QUESTION

TIME and again, decisions must be made as to whether or not this or that fruit farm machine should be repaired to last for another year or whether it should be traded for a new model. It's doubtful if any orchard equipment comes in for more consideration along this line than does the spray rig. For spraying, more than any other operation, must be carried out with a semblance of timeliness. A week's breakdown due to equipment failure may mean the difference between control or the lack of pest riddance, a profitable crop or one that is automatically thrown into the cull class.

When making repairs, there will be plenty of facts to face; so before starting or, better still, while making up your mind, don't lose sight of the fact that a repaired sprayer will seldom give the performance of a new one. Of course, there are certain repair tasks on any sprayer even if it has been on the job only one season. But with older rigs, any kind of repairing is actually a matter of patching—just a substitute for a new outfit from which only substitute performance can be expected.

To repair or not to repair, then, is often the question. And when this question comes up there are upwards of 1000 places where the repairs might and usually should begin. It may be a matter of a new pump and the repair of engine, tank, and accessories. Or, especially if one of the old, heavy-duty pumps are on the rig, it might be the engine that's in greatest need of replacement. As Tennessee horticulturist A. N. Pratt so aptly states, the grower is too often afraid to tackle the repair of a modern sprayer. Mr. Pratt has cleverly followed the route of the spray solution in outlining a method of repair.

With the mind made up that repairing will begin on the old outfit, there's no better place to start than with the tank strainer, right where the spray solution enters the rig. If the strainer is found to be embedded with grit, brushing should be resorted to and the strainer then painted with light cylinder oil. Suction strainers, next on the list, do not usually last more than two seasons, so it's a good idea to replace them with a 20 to 30-mesh copper screen. Worn or weak spots are dangerous in the suction hose. If necessary, a new hose should be substituted. Hose clamps should be tight and bolts should be clean enough for tightening if necessary.

It's granted that most valve troubles on the sprayer come from the pump intake valves nearest the hose inlet. Removed valves should be examined carefully for scratches and pits. When the seats are cleaned and are found to be worn or injured, best results will be obtained if they are replaced. In some types of valves, slight unevenness, light cuts, or scratches can be effaced by grinding. Such conditioning of valve parts will be wasted unless sound gaskets are used under seat and cover.

Since plungers are usually fitted with some type of washer to make them fit the cylinders smugly, and since these washers take a "beating" during the spraying season, experience has shown that it's best to replace them each year. Also recommended for replacement are all types of springs which come in contact with spray material. Manufacturers usually supply special packing for the collar on the outer end of the plunger. This collar prevents material which gets past the plunger cup escaping

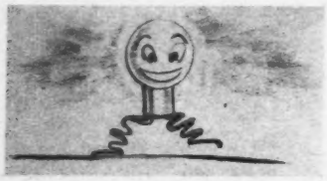
*(Continued on page 36)*

# STATE NEWS

CALIFORNIA—In the installation of a battery of sun-ray lamps similar to the electrotherapy lamps used by physicians lies the solution of preventing frost damage to fruit trees, in the opinion of Quinter E. Bashore, Covina inventor.

Bashore has installed 128 lights of 260 watts similar to those used in physiotherapy on a two and one-half acre lemon grove near Covina and succeeded in maintaining frost-resistant temperatures throughout a recent spell of cold weather, it is reported.

Bashore's theory is that the infra red rays keep the chlorophyl active in the leaves of the



plant or tree and that while leaves are active or absorbing light neither the foliage nor the fruit will freeze.

Moonlight is ultra-violet light and produces no heat, while infra-red rays are penetrating and provide the necessary heat. Lights are so arranged that each tree is exposed to the rays on all sides when the lamps are in operation.

Floyd Young, government meteorologist, and Dr. W. R. Schoonover of the Federal Experiment Station, Riverside, have expressed interest in the system.

OHIO—W. Dale Hilbish, Painesville fruit grower, has been appointed chief of the Division of Markets in the State Department of Agriculture under John T. Brown, newly appointed State director of agriculture.

Hilbish's lifelong activity as an apple grower and his agricultural interests and activities particularly fit him for the position. For the past five years he has been president of the Lake County Farm Bureau, and for three years since the formation of the Farm Bureau Cooperative he has been president of that organization. For the same length of time he has been president of the Agricultural Conservation Association, and for the past 10 years has been a member of the Ohio State Horticultural Society. In addition to all these offices, he has been particularly active as the secretary of the Ohio Apple Institute.—F. H. BEACH, Sec'y, Columbus.

NORTH CAROLINA—Three new strawberry varieties resulting from cooperative breeding investigations of the Agricultural Experiment Station at State College, the U.S.D.A., and the State Agriculture Department, have been named and recommended for commercial testing and production, according to E. B. Morrow, associate horticulturist at State College.

Of the three varieties, Eleanor Roosevelt is recommended for commercial use throughout the State. Fairmore and Daybreak are adapted especially to eastern North Carolina, the former being a commercial variety and the Daybreak a home garden and local market berry.

Eleanor Roosevelt is a large-fruited, productive variety and the fruit has a tough skin and ships well. Fairmore is a glossy crimson and firm fruit, of high dessert quality. Plants are more vigorous and foliage is freer from disease than any commercial variety now grown in eastern North Carolina. Daybreak is an early, highly flavored dessert variety, but the flesh is tender and the berry, therefore, is not adapted to shipping.

NORTH DAKOTA—The Red River apple named at the State experiment station in 1936 is being watched with interest, judging from the new friends it made in the fall of 1938. Fruits of this variety showed a lot of color when picked in mid-September, took on much more color after a few days of storage, and the color finally became strongly suggestive of the female parent Dolgo. While the flavor was not too much like Delicious, its pollen parent, it was very palatable out of hand. Cooking tests reveal Red River is excellent, also, for jelly or sauce. The variety seems to be quite resistant not only to the cold winters in this region and sunscald but to fire blight as well.—HARRY A. GRAVES, Sec'y, Fargo.

MASSACHUSETTS—Records would undoubtedly show that apple pie is the No. 1 favorite among men. That this holds true so far as fruit growers are concerned seems to be borne out by the interest which fruitmen took in the New England-wide apple baking contest sponsored by the State Department of Agriculture and recently held in Worcester during the 45th annual meeting of the Massachusetts Fruit Growers Association.

First place in the contest was awarded Mrs. Henry Delay, Harwinton, Conn.; second to Mrs. Raymond J. McKay, Derry, N. H.; third to Mrs. Helen Heal, Belfast, Maine. Other contestants: Mrs. Walter Carlson, Northboro, Mass.; Mrs. T. H. Parkinson, East Greenwich, R. I.; Mrs. Flora Benton, Middlebury, Vt.

For outstanding work in fruit activities and fruit judging scholarships of $25, $15, and $10 were awarded to Lloyd Briscoe, Groveland; Cecil Bellows, Shelburne Falls; Herbert Carlson, Paxton, by the Fruit Growers Association. All winners are members of vocational agricultural departments in high schools or county schools. It was specified that the money must be used to further their fruit projects.

Officers re-elected for the coming year: John E. Rice, Marlboro, president; vice-presidents; Arthur M. Howard, Pittsfield; R. A. Van Meter, Amherst; D. Walker Cheney, Brimfield; Hamilton Lincoln, North Brookfield; W. A. Green, Oxford; Fred C. Sears, Amherst; and secretary-treasurer, William R. Cole, Amherst.

MINNESOTA—At the University of Minnesota Fruit Breeding Farm a new greenhouse, 50 by 120 feet, is under construction; also a

new nursery stock storage cellar and packing shed. The greenhouse will be used exclusively for fruit breeding work and for propagation of new fruit stock seedlings and cuttings. The propagation bench will be equipped with artificial illumination to facilitate rapid and efficient propagation of this material.

About January 1 of each year fruit trees of all kinds, growing individually in large tubs, are taken into the greenhouse from the basement where they are stored after the close of the outdoor growing season. Different lots of these tubbed trees are taken into the greenhouse at regular intervals from about January 1 until April, in order to get a long succession of bloom before the natural blossoming season starts outdoors. In this way undesired cross pollination from roving insects is avoided, and it is also possible by careful timing to bring into blossom at the same time certain varieties that under normal outdoor conditions never would blossom together.

Operation of the greenhouse in this manner is one of the most important links in the fruit breeding program in Minnesota. The fruit breeding farm is one of the most extensive in the world, covering a total of 237 acres. At this season of the year the apple storage cellar contains about 100 of the best and most promising new selections from the apple breeding plots. These apples are sampled every 30 days to test their keeping quality in storage, and records of each of these new seedlings are taken for a number of years before a final decision on the value of each seedling is reached.—J. D. WINTER, Sec'y, Mound.

INDIANA — Experimental work at Purdue University by Prof. J. A. McClintock shows that Grimes Golden apple trees on Virginia Crab rootstocks produce more apples than when on any of 11 other rootstocks tested. These tests, figured on an acre basis, indicate that one acre of Grimes on Virginia will produce 95 bushels per acre more than Grimes trees on French Crab rootstocks, the stock now in general use.

(Cont'd on page 27)

John E. Rice, president, Massachusetts Fruit Growers Association, examining gavel made from wood of Endicott pear tree, oldest living fruit tree in U. S., now 309 years old and still healthy. At left, C. M. Wood, Danvers, Mass., who made the gavel. At right, Mrs. Rice. Presentation was made at Union Agricultural Meetings in Worcester.

# IN FOCUS
## AT THE ILLINOIS AND INDIANA STATE MEETINGS

Adding his bit of horticultural advice to the discussion of this trio of Illinois growers, Jud Freeman, Benton Harbor, Mich. (left), waits for reply comments from Mrs. Ethel DuBois, Cobden (right), Frank Penstone, Pittsfield (second from left), and Harry Allen, Carbondale.

Indiana officers in action! L. V. Doud, Denver, reads his president's report at the opening session. Vice-president Meredith Reed, Vincennes (left) appears to be checking on who's present. And Secretary R. L. Winkleplock is probably formulating one of his many meeting announcements.

Tied for top honors in the Illinois 95 Per Cent Clean Apple competition for 1938 were O. G. Jones, Mt. Sterling (right), and G. Leslie Smith, Rock Island (center). They are being congratulated by Dr. H. E. Barnard of the National Farm Chemurgic Council and of the National Apple Institute.

Among those who questioned University of Wisconsin's Dr. R. H. Roberts (right) after his talk on "Conditioning the Apple Tree" was Myron B. Schoff whose Illinois orchard is located near Peoria. The talk by Dr. Roberts was held as an evening session during the busy three-day Illinois meeting at Carbondale.

At Illinois meeting A. W. Bryant, Princeton (standing), waits for V. L. Page, Rockford, to fill out identification button.

T. I. Hosler, Grabill (left), proved an interested onlooker while J. A. McClintock, Purdue University, tried out the projector used for illustrated talks during the Indiana society meeting at Lafayette. The well-attended Indiana meeting was held at Purdue University.

**. . . but what a difference in growth!**

It hardly seems possible that the two trees pictured above are both the same age...that they were both planted at the same time in the same orchard a few feet apart...yet they were. They were planted in the spring of 1935 at a leading State Agricultural Experiment Station under the direction of a well-known pomologist and were dug and photographed in March 1938. The only difference in planting treatment was the addition of a 12-quart pail of moistened PIC Peat Moss to the fill-back of the tree on the left—but what a difference in growing results.

This is another practical demonstration of the value of PIC Peat Moss in successfully planting trees. It shows the importance of developing new root growth quickly.

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# CONTROL OF THE PEACH BORER

*(Continued from page 9)*

To avoid concentration of the vapor and any prolonged breathing of it, the emulsion should be prepared out-of-doors or in a well-ventilated room. It is desirable that the air temperature be between 50 and 80 degrees F. Since the compound boils at temperatures below the boiling point of water, heat should not be employed in making the emulsion, and the liquid should be kept away from fire and open-flame lights.

The emulsion may be prepared cold by stirring nine parts by volume of ethylene dichloride into one part by volume of potash fish-oil soap. A good grade of potash fish-oil soap should be used, that is, one without an excess of caustic potash and containing approximately 30 per cent of soap and 70 per cent of water.

To make the emulsion, place one part of potash fish-oil soap in a container and add slowly at intervals nine parts of ethylene dichloride, stirring constantly. When the fish-oil soap and ethylene dichloride are thoroughly emulsified, add water slowly with constant stirring until the emulsion measures two parts for each part of ethylene dichloride used. For example, if 18 gallons of the emulsion are desired, start with one gallon of potash fish-oil soap, to which add slowly at intervals with constant stirring, nine gallons of the ethylene dichloride liquid. Then add water, as directed, until the total quantity of the emulsion measures 18 gallons.

This is the stock emulsion and contains 50 per cent of ethylene dichloride. The stock emulsion is diluted with water before use, amount of dilution depending upon the age of the tree and the dosage required.

If the stock emulsion breaks down after preparation, this will be indicated by the appearance of globules of ethylene dichloride, and the material must be re-emulsified. This is done by pumping the material from one container to another or back into the same container, or by starting over again with a small quantity of potash fish-oil soap to which small quantities of the broken emulsion are added slowly at intervals with constant stirring.

The accompanying table gives the quantity of water to be added to the 50 per cent stock emulsion of ethylene dichloride to get 10 gallons of diluted emulsion of the different strengths and the dosages found by experiment to be most satisfactory for use on peach trees of various ages in the localities where the experiments have been carried on.

Ethylene dichloride emulsion can be applied for the control of the peach borer any time during the fall or spring, and in the South applications made during the winter will give good results. Best results will probably be obtained in the fall at the end of the egg-laying period of the peach borer moths, when most of the borers are small.

The emulsion can be applied either by spraying or pouring. The quantity should be regulated rather closely, since applications much in excess of the recommended dosage may cause tree injury. Applications are made by wetting the soil immediately surrounding the tree, and the lower part of the trunk should receive some of the material during treatment. No preparation of the soil before treatment is necessary on loose, level ground. In some cases, however, cupping the soil slightly toward the tree trunk to prevent the liquid from running off, or loosening the soil around the tree sufficiently to permit the liquid to be readily absorbed, will give better results. Several shovelfuls of soil should be placed against the trunk of the tree after treatment to prevent surface loss of the fumigant. The treatment requires no later attention.

**Ethylene Dichloride Stock Emulsion Dilutions**

| Age and size of trees | Quantity of water and of stock emulsion to use to get 10 gallons of diluted emulsion at the strengths used in the tests: Water | 50 per cent stock emulsion | Strength of the diluted emulsion | Dosage of the diluted emulsion for each tree |
|---|---|---|---|---|
| | Gallons | Gallons | Per Cent | |
| Six years and older (average size and larger trees) | 5 | 5 | 25 | ½ pint |
| Six years and older (small size trees) | 6 | 4 | 20 | ½ pint |
| Four and five years | 6 | 4 | 20 | ½ pint |
| Three years | 7 | 3 | 15 | ½ pint |
| Two years | 7 | 3 | 15 | ¼ pint |
| One year | 8½ | 1½ | 7½ | ⅛ pint |

A tin household measuring cup holding one-half pint, with marks for one-eighth and one-fourth pint, will be found useful if the ethylene dichloride emulsion is to be applied by pouring around the tree. A bucket pump or a power sprayer can be employed for applying the material as a spray. With a little practice the quantity applied with a bucket spray pump can be regulated without difficulty.

A device for regulating under pressure the quantity of spray used on each unit treated has been developed by the Bureau of Entomology and

*(Continued on page 38)*

# YOU CAN DEPEND ON YOUR HARDIE *for* PERFECT PERFORMANCE

DEPENDABILITY in a sprayer is measured by its continuous, uninterrupted performance. The repair bill for a breakdown may be small, but time lost in the midst of a busy spraying season always is costly.

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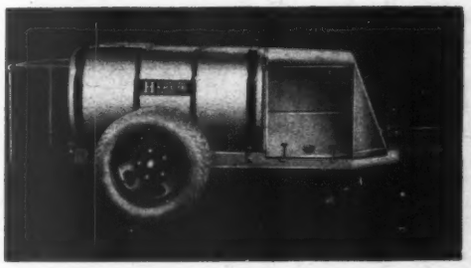
Steel or wood tanks, steel or rubber-tired wheels are available and interchangeable on all Hardies.



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INSECTICIDES FUNGICIDES

## *GRASSELLI LEAD ARSENATE

A heavy deposit lead of high killing power with good suspension qualities, compatible with summer oils. A dependable control for Codling Moth and other chewing insects.

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- *ALORCO Cryolite
- Paris Green
- *KOPPER'S Flotation Sulfur Paste
- *Black Leaf "40" Nicotine Sulfate
- Dust Mixtures
- *FLUXIT Spreader
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### BORDEAUX MIXTURE

A fungicide used to prevent bitter rot and blotch on apples, grape black rot and similiar fungous diseases. Avoid use on tender foliage.

### *SULFORON

A micro-fine sulfur that disolves instantly. Especially recommended for prevention of Apple Scab; and Brown Rot of Peaches, Plums and Cherries.

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A fluorine insecticide controls beetles and leaf-eating insects on vegetables, fruits and tobacco. It may be applied as dust or spray.

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# *Camera!*

Dr. Laurenz Greene, Purdue's horticulture chief (left), looks over a fruit tree cutting with veteran fruit grower J. M. Cantley, Logansport (center), and A. R. Sanders, Franklin, at the busy Indiana Horticultural Society annual meeting.

The nation's number one horticultural society meeting fan, Mrs. Kirk L. Keller (center), admires one of the Illinois 95% Clean Apple Club trophies with Miss Edith L. Hoffman of the National Apple Institute (left) and Mrs. W. F. Cherry.

Patiently waiting for start of one of the sessions at the Indiana meeting are (from left to right) John Williams, Three Oaks, Mich.; R. C. Simpson, Vincennes, Ind.; J. J. Davis, Purdue University's entomologist; and R. A. Simpson, Vincennes.

# STATE NEWS

(Continued from page 20)

The Virginia Crab rootstock not only increases the number of fruits per tree by producing a larger fruiting surface, but also produces a higher percentage of larger apples.

Most of the Indiana work has been confined to Grimes as the scion; however, bearing trees of Ben Davis show their superiority as to yield and size of fruit when grown on Virginia. Preliminary work on non-bearing trees indicates that probably Stayman and its red bud sports are the only important commercial varieties which are not superior on Virginia Crab rootstocks. Indiana growers will be interested to learn that the Turley (developed by the Indiana Horticultural Society) is making excellent wood growth on Virginia and is expected to yield much better than it does on French Crab roots.

Meredith Reed, Vincennes, one of the largest fruit growers of the State, was elected president of the Indiana Horticultural Society at the recent meeting. Robert C. Simpson, Jr., also of Vincennes, was elected vice-president.—R. L. WINKLEPLECK, Sec'y, Lafayette.

GEORGIA—A campaign to obtain peach growers' voluntary contracts pledging payment of one cent per bushel of their interstate shipments next season for adequate and profitable promotion of the 1939 crop has already been launched by the Georgia Association of Peach Growers.

Funds thus raised will be expended by the association "towards its work of merchandising and promoting the sale of Georgia peaches, increasing the demand therefor, improving existing markets and creating additional markets, and otherwise in furtherance of the interests and welfare of the peach industry in Georgia, all in accordance with its plan of operation."

None of the funds will be used to further the sale of any particular brand of Georgia peaches.

RHODE ISLAND—Annual meeting of Rhode Island Fruit Growers Association will be held at Providence, February 16. One of the principal talks at the meeting will be broadcast at 6:45 P.M. A question and answer period will follow the talk. This program will be part of the series sponsored that week by the Rhode Island Agricultural Conference over Station WPRO.

All growth not fully mature at the time of the hurricane of September 21 is continuing to shrivel and die back. Full extent of the injury will not be known for many months.—E. P. CHRISTOPHER, Sec'y, Kingston.

NEW JERSEY—First-hand information regarding views of consumers on local products was presented fruitmen for the first time during the 62nd annual meeting of the State Horticultural Society.

Mrs. Marie C. Doermann, extension specialist in nutrition at the agricultural college, presented actual consumers from three counties and reports from those in two other counties.

The discussion brought out the fact that the fruit growers themselves must go further in educating the consumers and merchants because there is a public wanting to purchase their products.

Meeting election results: Lawrence J. Smith, South River, was elected president of the society for two years to succeed Ralph B. Starkey of Mullica Hill, who was named to the executive committee. William K. Hookstra of Beverly was elected vice-president, and Arthur J. Farley was re-elected secretary-treasurer. L. B. Coddington, Jr., for 30 years fruit specialist of the State Experiment Station, was elected to the executive committee.

SOUTH DAKOTA—Samples of new apple varieties originated at the University of Minnesota were exhibited by Dr. W. H. Alderman,

(Continued on page 30)

"WE FIND OUR DIESEL D2 CUTS THE FUEL BILL TWO-THIRDS!"

— W. E. FRYE & SONS, *Van Buren County, Michigan*

After a season's experience with their "Caterpillar" Diesel D2 Tractor, on 160 acres (principal crop, apples), W. E. Frye & Sons offer a comparison that carries authority:

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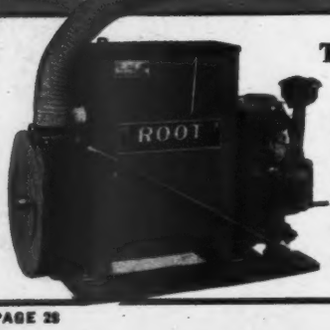


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## FIGHTING FIRE BLIGHT

*(Continued from page 12)*

In 1937, the work was continued by the writer. Portions of Grimes Golden and McIntosh apple trees received one application of 2-6-100 Bordeaux when approximately one-half of the flowers were open. The individual trees were divided, one-half of each being covered with a tarpaulin while the other was sprayed thoroughly by means of a power machine (400 pounds pressure). The unsprayed half of each tree served as a check. There was no reduction in set and no russeting of the fruit. Similar results are reported from New York, following studies conducted during the past 10 years at Cornell University.

The results of the tests reported above show that a material reduction in flower infection by fire blight has followed the application of weak Bordeaux to apple and pear trees in Indiana orchards. The results of more recent work in other states and observations made by a number of commercial growers agree with these conclusions. Additional studies in Indiana have demonstrated the need for spraying during the blossoming period for the purpose of controlling apple scab in some seasons. No serious russeting or reduction in set of fruit has occurred in Indiana as the result of spraying with weak Bordeaux during the period of blossoming. Owing to these facts, the application of 2-6-100 Bordeaux to susceptible varieties of apple and pear as the flowers are opening is suggested in the Indiana spray schedule.

An infected pear flower is shown in one of the accompanying illustrations. In the second photograph on page 12 the normal progress of the disease in an apple or pear cluster is illustrated. The two withered flowers became infected following spread of the bacteria to the cluster early in the blossoming period. Usually only one or two flowers in a cluster become infected immediately following the introduction of the bacteria into the cluster. Following this initial infection of an individual flower, the bacteria progress down the pedicel or flower stem into the base of the cluster. From there, the bacteria progress upward through the pedicels of the other flowers, in this way involving the entire cluster. The importance of preventing the initial infection in a cluster, therefore, is obvious. Furthermore, prevention of the initial infection of the flowers eliminates an important means of increase of the inoculum and reduces, greatly, secondary spread to adjacent parts of the tree.

In the Indiana tests, and in most instances where commercial growers have used weak Bordeaux for blight

prevention in this State, only one application has been made, usually when 40 to 50 per cent of the flowers were open. In the case of Grimes Golden, since the wood is quite resistant while the flowers are very susceptible to blight infection under Indiana conditions, only this one application seems necessary to provide adequate protection. There is evidence, however, indicating that two applications, (1) when 20 to 25 per cent of the flowers have opened, and (2) when 50 to 60 per cent are open, would be warranted in some seasons in the case of pear and apple varieties in which the wood, as well as the flowers, is very susceptible. Crop reduction and rather serious injury to trees resulted from fire blight infection in some orchards in Indiana in 1938. Under such conditions, one would expect to find a comparatively heavy source of infection present in these orchards in 1939. Weather conditions may or may not favor the development of the disease in 1939. If, however, rains and comparatively high temperatures (above 60 degrees) should occur during the blossoming period two sprays might be warranted in such orchards in 1939. No arsenate of lead should be included in sprays applied during the blossoming period, for this material is very poisonous to bees.

A number of Indiana apple growers have adopted the practice of regular use of 2-6-100 Bordeaux early in the blossoming period. If one may draw conclusions from statements made by other growers in letters, conversations, and at meetings following the serious outbreak of blight last season, many others will use the spray in 1939.

One of the first speakers on the Indiana meeting program was Hoosier fruit grower E. V. Hawkins, Mitchell (right), who talked on his experiences with modern orchard pruning methods. He was "snapped" by AMERICAN FRUIT GROWER cameraman while checking the talk with horticulturist Monroe McCown.


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THIS year make the 3-way savings that every John Deere Tractor owner enjoys . . . savings made possible by John Deere Orchard Tractors.

*Save time.* Four forward speeds, positive shock-proof steering, foot-operated differential brakes for short turns around trees, at fence lines and headlands, and convenient controls speed up every orchard operation.

*Save money.* Exclusive two-cylinder engine design makes it possible to burn the low-cost fuels successfully; to make practically all inspections and adjustments yourself; to get a greater return from your tractor investment because of longer life due to sturdier, heavier parts.

*Save trees.* The compact, low-built, carefully shielded John Deere Orchard Tractor protects low-trimmed trees, blossoms, and fruit.

Ask your dealer to demonstrate not only the John Deere Orchard Tractor but also the efficient, cost-cutting equipment built specially for it, and write, today, for free folders.

Here's the John Deere Model "AO" pulling a light-draft No. 47 Grove Plow. The Model "AO" pulls two 16-inch bottoms in most soils and handles all other comparable drawbar loads.

The John Deere Model "BO" Tractor and Power Mower make short work of heavy growths. The Model "BO" pulls two 14-inch bottoms under most soil conditions and gives long, trouble-free service.

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# A Ton of Freight moved 100 miles

## *to buy each tie in this picture*

FARMERS work as hard for their money as anybody in America.

But railroads work hard for their money too.

For instance, to take in enough to pay for one crosstie ready to put in the track—a ton of freight must be hauled, on the average, more than 100 miles.

That doesn't mean that the profit on hauling a ton of freight 100 miles is enough to pay for a tie, because we're not talking of profits—we're talking of the total amount the railroads receive.

On this same basis, a ton must be hauled three miles to buy a postage stamp—or five miles to buy a nickel lead pencil.

A railroad spike takes the income from hauling a ton of freight a mile—and to buy a 100-pound steel rail 39 feet long takes the total income from hauling a ton of freight 2,500 miles—farther than the distance from Chicago to San Francisco.

When you realize that American railroads haul an average ton of freight one mile for about one cent, the marvel is that they are able to provide such safe, dependable, fast transportation — the finest service in the world. No other transportation agency gives so much for so little.

And in order for the railroads to keep on providing the dependable and economical transportation service which American farmers and industry must have, they need common-sense treatment such as this:

*Treat the railroads as a business. Give them reasonable freedom to "price" their only product—transportation service. Give them greater freedom to adjust rates to meet competitive situations, to adjust services to the demands of traffic; and to adjust expenses to the condition of their business. And give them equality of treatment and opportunity—equality with other forms of transportation in matters of regulation, taxation, subsidy and the like.*

This common-sense treatment which railroads need is outlined in horse-sense terms in a brief pamphlet. Write today for your copy.

SAFETY FIRST— *friendliness too!*

ASSOCIATION OF AMERICAN RAILROADS

WASHINGTON, D. C.

## STATE NEWS

(Continued from page 27)

head of the Minnesota Department of Horticulture, during the 55th annual meeting of the State Horticultural Society.

There is considerable interest in the Haralson apple throughout northern regions of the United States, according to Dr. Alderman, and this variety is being extensively planted in Canada. In Minnesota, it now ranks sixth in existing orchards. Haralson is a large, red, long-keeping winter apple, bears young, annually, and heavily.

Wedge, a large, handsome red apple, is well adapted for culinary use, particularly for baking. Beacon, another large, red apple, is in the season of Duchess and much better for eating.

The 1939 officers of the society are: H. E. Beebe, Ipswich, president; George W. Gurney, Yankton, vice-president; H. N. Dybvig, Colton, treasurer; Mrs. F. Briley, Dell Rapids, librarian.—W. A. SIMMONS, Sec'y, Sioux Falls.

FLORIDA—With world-famous scientists taking part, Florida oranges, grapefruit, and tangerines are being given the closest scrutiny to which they have ever been subjected, in an effort to establish certain accepted facts. The research work is sponsored by the Florida Citrus Commission.

Columbia University, University of Maryland, and the National Bureau of Standards are co-operating in the research program. Designed as the citrus commission's contribution to medical knowledge, the work is under the supervision of such well-known and eminent men as Prof. H. C. Sherman of Columbia University, whose original researches in the field of vitamins resulted in adoption of the "Sherman unit" as a standard of measurement for some of the vitamins; Prof. Arthur W. Thomas, also of Columbia; Dr. Solomon Farley Acree, of the Bureau of Standards; Dr. L. H. James, of the University of Maryland; Dr. Harold F. Pierce, research physician and former associate professor at Johns Hopkins University, and Dr. Sterling Y. Mead, dental author and authority.

New information which the research work will uncover is expected to open markets untouched because of lack of knowledge.

KANSAS—Officers who will handle the affairs of the State Horticultural Society during 1939 are: Dr. W. F. Pickett, Manhattan, president; James Homer Sharpe, Council Grove, vice-president; Basil Rechel, Hutchinson, treasurer.—GEO. W. KINKEAD, Sec'y, Topeka.

VIRGINIA—The Southern Railway has informed State Horticultural Society headquarters that its request has been granted for permission to reduce the minimum carlot weight on apples from points on its lines to southern points.

The present minimum of 30,000 pounds per car has been reduced to 24,000 by permission of the Interstate Commerce Commission.

Growers previously have been required to ship at least 600 bushels per car. Under the new ruling the minimum will be around 516 bushels per car. The smaller car ruling will be especially advantageous in warm weather and to smaller towns.

It is expected that other railroads will also be given permission to reduce the weight of apples shipped in carlots.—W. S. CAMPFIELD, Sec'y, Staunton.

NEW YORK—Importance of continued emphasis on improvement of agricultural marketing practices was stressed by Governor Herbert H. Lehman in his message to the opening session of the 1939 New York legislature.

"Advances in transportation and refrigeration," he pointed out, "place our principal State markets within easy reach of the products of competing states. This competition must be met by improved marketing of our own products.

(Continued on page 42)

## CODLING MOTH CONTROL

*(Continued from page 13)*

plication. It can be used in practically any spray schedule, that is, a schedule where lead arsenate, fungicide, and spreader are used, or one in which lead arsenate, spreader, and summer oil are used, or one in which the calyx and first cover sprays consist of lead arsenate followed by fixed nicotine-oil schedule, that is, one of the typical non-washing schedules. The results obtained with this spray combination in 1937 and 1938 have been very good.

At the present time we would say that the old combination of lead arsenate and lime alone does not give satisfactory codling moth control in any of the more heavily-infested areas where the infestation is general and orchards are fairly close together. In any of these heavily-infested areas it is necessary to use oil or some additional material to bring about satisfactory control in years that are favorable to codling moth. In fact, in almost any year.

We might suggest three schedules that will give good results if thoroughly applied at the proper time in any of these sections:

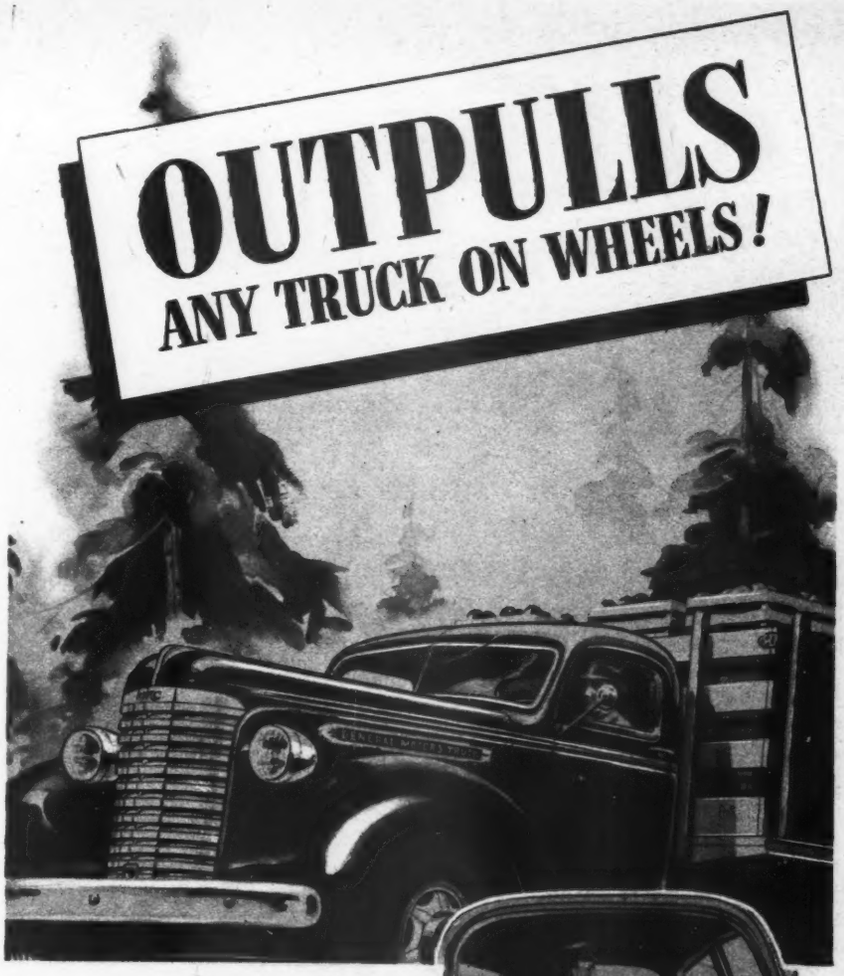
1. Which is the cheapest but which will give good results is a schedule consisting of the prebloom sprays in which a fungicide is used, followed by a calyx spray consisting of fungicide and lead arsenate at from two to three pounds to the hundred gallons; a one-week spray consisting of a fungicide, lead arsenate at four pounds to 100 gallons if curculio is present, followed by three first brood covers containing lead arsenate, a spreader, and sticker, and two quarts of any good brand of summer oil to each 100 gallons, these sprays to be applied at approximately 10-day to two-week intervals. Fruit so sprayed will require washing. Except in extreme infestations it should be reasonably free of codling moth.

2. The second suggestion would be with the prebloom sprays the same as the first, a calyx and first cover spray with lead arsenate, followed by a fixed nicotine and oil spray for the remainder of the season.

3. The third suggested schedule would be either of the above-mentioned plus one pint of nicotine sulphate to each 100 gallons of spray for the first three covers following the calyx.

These schedules are merely suggestions. For details as to the best schedule to use, the timing, and combinations of spreaders and stickers, consult your own state experiment station. The entomologists and horticulturists of that station have been studying the codling moth problem in your state and can, in general, give you far better advice than those from distant points.

*(Continued on page 41)*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TEN, twenty, or thirty years hence—about the time when you would like to ease up on caring for the trees and let the trees care for you — your crops, your income, even the condition and salability of the orchard itself, will be determined by how well soil fertility has been maintained in the meantime.

GRANULAR 'AERO' CYANAMID is the best nitrogen fertilizer for the long pull.

Its nitrogen (21%) not only feeds the tree and the cover crop, but is especially effective in transforming raw organic materials into humus.

Its lime (70%) prevents development of acidity. It combines with organic matter to make sweet humus.

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## GAINS IN WAR ON FRUIT MOTH

*(Continued from page 14)*

small that they had little effect on the rapidly increasing numbers of the fruit moth. Injury varied from 39 per cent to 73 per cent in individual orchards.

In 1930, the pest spread eastward from Niagara County over all of Orleans County. Nineteen colonies of parasites were released in the western portion of Niagara County. By the end of 1931 the fruit moth had infested practically all orchards in Niagara, Orleans, Monroe, and Wayne counties, an area that contains over 60 per cent of the peach trees of New York State. In that year, 41 more colonies of parasites were established over the entire area of infestation in western New York. Spread of the pest eastward was followed with parasite liberations as closely as possible. Since 1931, many more colonies have been distributed in that area.

While data for the past decade are complete only for Niagara County, it should be pointed out that none of the other counties have yet suffered as severely as did Niagara, in spite of the fact that the pest has now been present in them for over seven years. It is believed this is due in large measure to the fact that parasites were liberated in these areas soon after the fruit moth became established in them.

Now let us follow in detail the story in Niagara County for the past 10 years. By 1929, the entire county was infested but only the western portion showed severe damage. Parasites were liberated there and fruit infestation counts were made. The number of parasites liberated had little immediate effect on the rapidly increasing numbers of fruit moth. In 1930, the western portion again received all parasite liberations. It also showed the highest percentage of injured fruit, but counts over the entire county gave a much lower average infestation than the previous year. The highest infestation in any individual orchard was much below the average for all orchards the previous year, indicating that the parasites were finally exerting an appreciable degree of control.

Parasites were distributed over the entire county for the first time in 1931. Average infestation for the county was slightly below that of the preceding year, but, what was more important, the highest percentages of injury were found in the eastern part of the area. This showed the infestation to be lowest in the western portion where the parasites had been established longest. In 1932, parasites for the county were distributed in the eastern half only,

and since 1932 practically no parasites have been released in the county, except some of the foreign species.

Fruit injury was about the same as in 1931, but the movement of heavy damage from west to east was more pronounced. The average infestation in the western portion was only half that in the eastern end of the county. In 1933, the average injury for the county dropped somewhat and there was little difference between the two sections. In 1934, there was an entire absence of fruit in western New York with the exception of a small area along the Niagara River. In those orchards that produced any fruit, the crop was about normal and the injury was below that of the preceding year.

Absence of fruit in most orchards aided the parasites materially because these parasites destroy only twig-infesting larvae of the first and second broods. The fruit-infesting larvae of the third brood usually escape parasitism. Consequently, the lack of fruit for the third brood caterpillars forced many of them to feed in twigs where the parasites could reach them, and it also resulted directly in the death of many more larvae from starvation because generally the twigs are too hard in late summer for the caterpillars to feed. During 1935 and 1936 the fruit infestation dropped still lower. In 1937 it rose somewhat, but it was down again to a negligible amount in 1938.

Ever since 1933, the growers of Niagara County have been little concerned about injury caused by the fruit month. It is to be hoped that this desirable state of affairs will continue. Have parasites been *entirely* responsible for this? Probably not, but they certainly have played a large part in the reduction of infestation. It is noted that *Macrocentrus* has taken an increasingly greater toll of fruit moth larvae each year until 1935. In the three succeeding years it has fluctuated somewhat, but the trend is still upward. The appearance of large numbers of a native parasite, *Cremastus*, in 1931, 1935, and 1937, raised the total parasitism in those years. But this species is rather erratic and not to be depended upon. No other parasite has shown promise of replacing *Macrocentrus*. It still remains the most effective species yet discovered.

Space does not permit detailed discussion here of what has happened in the remainder of western New York since the advent of the fruit moth. However, in brief, Orleans, Monroe, and Wayne counties showed some infestation in 1931. Parasites were distributed in all three counties in that year and in each subse-

*(Continued on page 37)*

# JUST HOW SMART ARE YOU *about tractors?*

**(SMART ENOUGH TO SAVE YOURSELF MONEY NEXT SPRING, IF YOU CAN FINISH THESE STATEMENTS CORRECTLY)**

***Make one choice under each statement***

**1.** The tractor that set a new fuel economy record in recent official tests burned as a fuel:

a. Stove tops c. Kerosene
b. Distillate d. Fuel oil
e. Regular-grade gasoline (containing tetraethyl lead)

**2.** As shown by tax rebate figures on gasoline used for non-highway purposes (consumed almost entirely on farms), gasoline used increased in 1937 over 1935:

a. 49% b. 38% c. 26% d. 12% e. 2%

**3.** The new tractor announced recently with a Chrysler truck-type engine, which has a compression ratio higher than the average of automobiles, is manufactured by:

a. Oliver c. Graham-Bradley
b. Minneapolis-Moline d. Massey-Harris
e. Silver King

**4.** A survey of Master Farmers shows that the next tractors they buy will be high compression in the following ratio:

a. 1 out of 6 c. 1 out of 3
b. 5 out of 6 d. 1 out of 2
e. 2 out of 3

**5.** Three years ago there were no high compression tractors. Today the number of tractor manufacturers offering high compression tractors in standard or optional models at no extra cost is:

a. 2 b. 8 c. 10 d. 5 e. 3

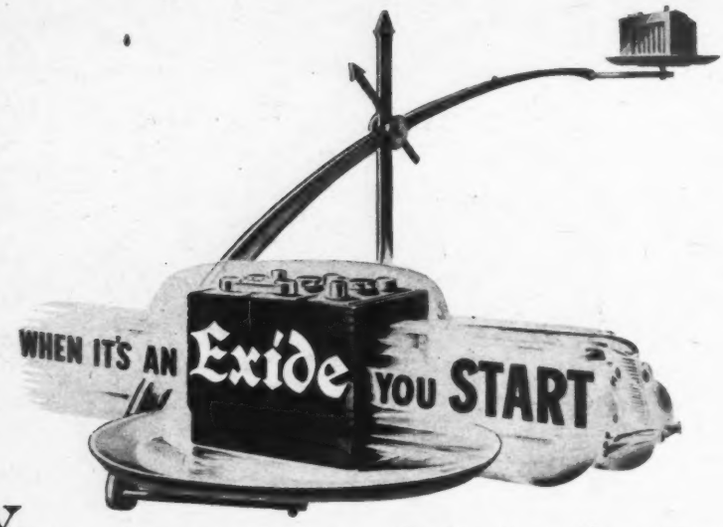
**A TIP:** Score yourself 20 points for each question answered correctly. (Answers given below.) A score of under 40 means you haven't been keeping up with the new developments in tractors. From 40 to 60 is good. Above 60 is excellent and probably means you're all set for profitable tractor farming in 1939 with a high compression tractor using regular-grade gasoline (containing tetraethyl lead).

Ethyl Gasoline Corporation, Chrysler Building, New York, N. Y. Manufacturer of anti-knock fluids used by oil companies to improve gasolines.

1. e. Regular-grade gasoline (containing tetraethyl lead).
2. a. 49%
3. d. Massey-Harris, Model 101. All companies named, however, make high compression tractors.
4. b. Five out of six Master Farmers said their next tractors would have a high compression engine.
5. c. Ten tractor manufacturers now offer high compression tractors in standard or optional models.

IT PAYS TO BUY GOOD GASOLINE FOR CARS, TRUCKS AND TRACTORS

# IF YOU COULD WEIGH DEPENDABILITY IN BATTERIES

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## *Depend on Your*
# SPRAY

This year why experiment with pest control . . . and profits? Rid your orchards of costly pests with SUNOCO Spray!

Proved by more than 15 years of wide and successful use, SUNOCO Spray is the efficient dormant and delayed dormant spray control for Scale Insects, Red Mite, Apple Aphis and Red Bug.

SUNOCO Spray is a safe, effective petroleum product; mixes readily with water and is non-corrosive. Obtain SUNOCO Spray through any of the following:

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## NOTABLE NUT TREE COLLECTION

THE collection of nut trees in the Arnold Arboretum is probably the best and most complete in the world. It was gathered together over a long period of time by the late Prof. C. S. Sargent, for many years the director of that institution. Prof. Sargent, and trained collectors working for him, searched all parts of the North American continent for all available forms of woody plants, including nut trees. This collection of nut trees was inspected by the members of the Northern Nut Growers Association at their recent Boston meeting.

The layman may inquire as to the reason for collecting and maintaining so many species of trees, quite a number of which are of little or no value for their nuts. A collection of plants such as this serves two purposes. It provides a display and serves to embellish an area of ground as in a park. It provides material for the student of plants. A specialist in hickories, for example, may come to the arboretum where he will see most of the known species and botanical varieties. To find equivalent material in the wild state, months of searching at much expense would be necessary. He would also find at the arboretum facilities for studying this material.

The systematic botanist, the landscape gardener, the student of rootstocks, the cytologist, the pathologist, and entomologist would all find this collection useful. Moreover, students at other research institutions and nurserymen may procure propagating material from the arboretum.

In a paper presented before the Northern Nut Growers Association, Prof. E. J. Palmer of the Arnold Arboretum staff discussed the arboretum's collection of nut trees and the different species. Appended to Prof. Palmer's paper is a list of species now growing in the arboretum. The collection including species and botanical varieties contains 34 Corylus, including some pomological sorts, 34 Castanea, 20 Juglans, and 31 Carya.

The grafting forms on which experimenters may record the conditions and results of their nut grafting experiments may be purchased from the secretary at one-half cent each. Sample will be sent for a three-cent stamp.—GEORGE L. SLATE, *Sec'y*, Northern Nut Growers' Association, Geneva, N. Y.

An Illinois Society visitor, Patterson Bain, Columbia, Mo. (left), looks at camera while talking to W. P. Flint, entomologist of the Illinois Agricultural Experiment Station, who spoke on latest codling moth control methods during sessions of Illinois meeting.

## 1939 SPRAY ARMY

*(Continued from page 11)*

modernized their products. The insecticides and fungicides available today are the result of scientific research in laboratories and orchard testing grounds, but, if equally modern equipment were not available for the proper application of these materials, their effectiveness would be lost and pests and diseases would continue to flourish. The grape growers of an early day in France, plagued by their many pest and disease problems, concocted the mixture which we now know as Bordeaux. They had discovered an effective compound, but they had only brooms with which to apply it to the vines. Imagine a vineyard operator today attempting to control black rot, mildew, leafhoppers or phylloxera with bucket and broom. The controlword today is "Coverage" and it takes modern spraying and dusting equipment to guarantee it.

Study the modern sprayers and dusters in the trade exhibits at the next state meeting or on the pages of a catalog. You will marvel at the many ways in which such equipment has been modernized. Streamlining, for example, is the rule rather than the exception. Power take-offs are becoming increasingly popular. Rubber tires are now considered standard equipment. Pressures and velocities unheard of 10 years ago are today available on regular models. Even the steering mechanism is now coming in for its share of scientific engineering. In one manufacturing plant recently visited the working model of a new duster embodying new steering design which permits sharp turning at row ends was proudly displayed.

Although streamlined and modernized, today's easily-mobile, multiple-pressure sprayers and dusters can "take it" just as well, if not better, than could the cumbersome, hard-to-handle, low-pressure rigs of earlier days. In refining today's equipment, manufacturers have not forgotten that growers demand built-in ruggedness and strength, together with reliability and the ability for top-efficiency performance under oft-times gruelling orchard working conditions.

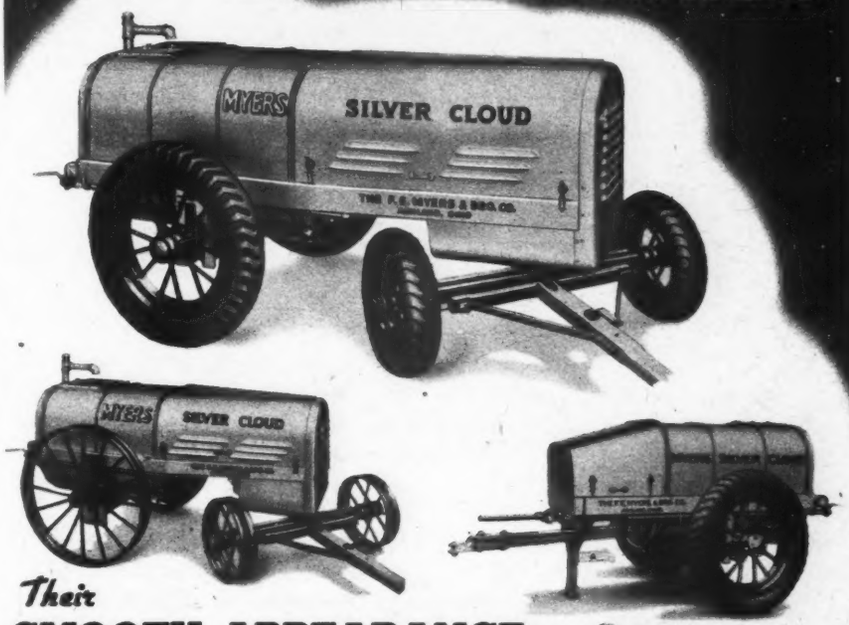
Further observation of new equipment reveals that where the power unit is a part of the rig, engines have become standardized to the high compression gasoline type.

Coupled with the improvements in the outward appearance of spraying and dusting units are the cut-under types of tank construction and the use of large tires. These large tires prevent bogging down of heavily loaded sprayers and dusters, and, in addition, provide new riding ease for operators.

Modernization has also evolved a new order of accessories for sprayers

*(Continued on page 44)*


# MYERS *Silver Cloud* POWER SPRAYERS

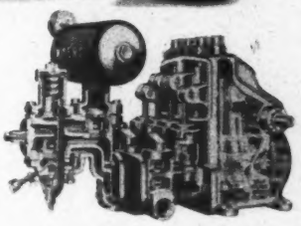



*Their*

## SMOOTH APPEARANCE

*bespeaks their*

## SMOOTH PERFORMANCE



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The MYERS line includes sprayers of every wanted type and capacity for work in orchards, groves, vineyards, row crops, fields, gardens and greenhouses. Hose sprayers, boom sprayers, combination sprayers ... engine powered, tractor powered, traction driven and hand operated sprayers ... wheeled sprayers, stationary sprayers and portable sprayers ... tank sprayers, barrel sprayers, bucket sprayers, knapsack and compressed air sprayers. There's a MYERS dealer near you, ready to supply your needs and assure prompt service. MYERS Spray Catalog is free. Check the convenient coupon below and mail it TODAY.

MYERS *Silver Cloud* Power Sprayers are available in both wheeled and wheelless models of varying sizes and capacities: for operation by gasoline engine or power take-off from tractor. Wheel models furnished with either steel or rubber-tired wheels. Frames are all steel, arc welded. All models come completely equipped with two leads of hose, guns and fittings.

MYERS *Self-Oiling* Power Spray Pumps are the key to the remarkable satisfaction given by MYERS power spray equipment. Justly noted for both their perfect lubrication and their proven service life. All working parts run in oil and are fully enclosed, yet readily accessible for control and adjustment. VALVES stainless steel. CYLINDERS porcelain lined. PLUNGERS improved double cup expansion type with adjustable take-up. Duplex, Triplex and Quadruplex sizes according to capacity needed. Pressures up to 800 pounds if desired.

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## REPAIR PROBLEMS

*(Continued from page 19)*

and helps to maintain plunger-cylinder alignment.

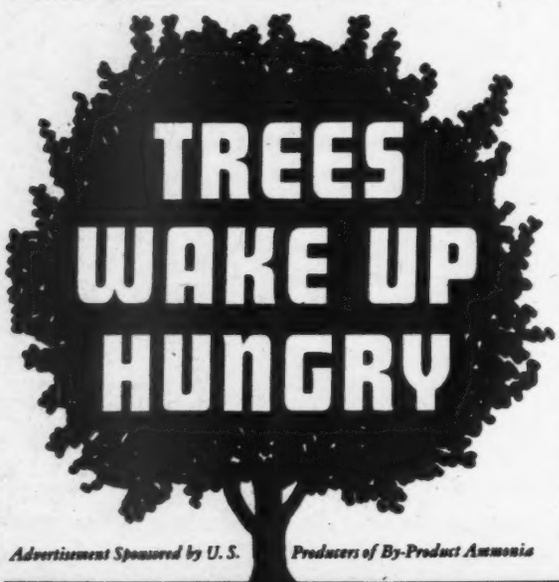
Outlet or discharge valves and relief or automatic overflow valves should receive the same attention as the intake valves, with subsequent replacement or correction as needed. There is usually a rubber plate known as the diaphragm in the base of the relief valve. Elasticity of the diaphragm is usually lost after a season's work due to the action of oils which swell and decompose the rubber. Making sure that holes line up accurately, the diaphragm should be replaced each year. And the valve stem resting on the diaphragm should be carefully cleaned and polished. The upper part of this stem passes through a packing nut and will work better if repacked with the manufacturer's special packing or with candlewick that has been well coated with graphite grease.

Scales, bits of spray material, or rust have probably collected in the pipe leading from relief valve to hose, so experienced growers usually remove the pipe, tap it with a mallet or light hammer, and remove the trash by thumping on wood floor or block.

Cutoffs which will not stop the flow of materials completely had best be discarded. Repacking of the gland in the handle helps to make a complete repair job. Don't forget to see that the hose is in good shape and that the tightening clamp bolts turn freely. Repacking of shut-off valves, replacement of nozzle disks and rubbers and coating threads of nozzle disks with grease will put guns and brooms into good shape.

When taking up pump wear or lost motion by removing shims in the con-

*(Continued on page 41)*


**SPRING WEATHER is an alarm clock to a fruit tree. Trees are hungry for Nitrogen, *the growth element.* There is a big job ahead. Nitrogen is needed in roots, twigs, bark and buds to make blossoms and fruit.**

**The soil solution will have Nitrogen ready for the roots to send it up to the twigs when growth starts if you apply Sulphate of Ammonia early, at least two weeks before blossoming. *Domestic* SULPHATE OF AMMONIA is rich in Nitrogen—20.5% guaranteed—all soluble, all available. It is always dependable . . . clean . . . easy to handle . . . easy to apply.**

**Fruit trees, to produce well, must make rapid growth in early spring and slow down during summer and fall in order to permit the accumulation of starches and sugars necessary for size and color of fruit, hardness of twig growth and strong fruit buds for next year's crop.**

**Your trees will wake up working if you apply *Domestic* SULPHATE OF AMMONIA *very early,* at least two weeks before blossoming. It is both quick-acting and lasting in effect. It offers you the best value for your money.**

**Use *Domestic* SULPHATE OF AMMONIA this year.**

*Advertisement Sponsored by U. S. Producers of By-Product Ammonia*

# Domestic SULPHATE OF AMMONIA

## GAINS IN WAR ON FRUIT MOTH

*(Continued from page 33)*

quent year to date. By 1932, Orleans showed 32 per cent fruit injury, Monroe 14 per cent, and Wayne nine per cent. In 1933, Orleans had 21.5 per cent and Wayne 29 per cent. No counts were made in Monroe. In 1934, there was no fruit in any of these counties and no counts were made. In 1935, Orleans showed six per cent, Monroe six per cent, and Wayne nine per cent.

The lack of fruit in 1934, coupled with the activities of the parasites, was very beneficial in checking the fruit moth. In 1936, Orleans County remained at about six per cent, but Monroe had 23 per cent and Wayne 25 per cent. In 1937, Orleans had 17 per cent, Monroe 27 per cent, and Wayne 28 per cent. In 1938, Orleans was back down to six per cent fruit injury, Monroe showed 26 per cent, and Wayne was down slightly to 17 per cent.

It appears that Orleans County has about reached the same state of affairs as prevails in Niagara, but that Monroe and Wayne counties require more time for the parasites already present there to build up or that they require more liberations of parasites. Or it may be that both of these are necessary.

However, in spite of the fact that considerable damage is still occurring in Monroe and Wayne counties, it should be remembered that at no time has any orchard in these counties, or in Orleans County for that matter, showed as much injury as the *average* infestation in the Niagara district in 1929.

Concluding a recent talk on oriental fruit moth parasites, Dr. Philip Garman, assistant entomologist at the Connecticut Agricultural Experiment Station, remarked that caution is a necessary factor in considering the parasitism. He emphasized that the work is relatively new, that continued and increased experimentation is necessary. Garman ended his report with: ". . . we should realize that the oriental fruit moth is a pest of great potential for injury . . . We should not forget that the oriental fruit moth is a first cousin to the codling moth."

---

When U.S.D.A. workers raised ice racks in refrigerator car bunkers to accommodate only half the amount of ice formerly used, they found that pears and oranges shipped in the cars and precooled before the shipment started arrived at their destination in good shape. Special recording equipment showed more rapid circulation of cold air with the half-bunker icing.


# Control Codling Moths . . . Eliminate Washing *with*

# NICO-SOL SUMMER SPRAY OIL

## *at LOWER COSTS*

● GOOD NEWS for commercial Fruit Growers! Standard Oil Research Laboratories have developed NICO-SOL Summer Spray Oil, a superior and more economical codling moth control treatment. This new type Summer Spray Oil has all the advantages of the best oil-nicotine compounds. *Yet it costs less to use!*

It's new, yet it is thoroughly-tested and orchard-proved and ready to use just as you buy it. No mixing required.

DOES AWAY WITH WASHING EXPENSE. It's more than a highly efficient codling moth control treatment. NICO-SOL Summer Spray Oil also eliminates cost of washing and offers these added advantages:

1. Production of larger, better-finished fruit.
2. No arsenical injury.
3. Fewer sucking insect injuries.
4. Lower cost.

## SUCCESSFUL COMMERCIAL GROWER REPORTS NICO-SOL COSTS 25% LESS

***Read what Mr. Funk has to say about NICO-SOL Summer Spray Oil***

Standard Oil Company (Indiana)
Chicago, Illinois.

Gentlemen:

My experience with NICO-SOL Summer Spray Oil last year was very remarkable. It was not only much superior to other fixed nicotine combinations I used, but it costs considerably less.

*J. W. Funk (above) who operates 388 acres of orchards in Vincennes, Indiana, used* NICO-SOL *on 30 acres of apples in* 1938

Out of a total of 130 acres of apples I used NICO-SOL on 30 acres. The control on this orchard was so much better than the other orchards where a combination of fixed nicotine was used that I am going to use NICO-SOL on all orchards in 1939. I found that I saved 27c per 100 gallons of spray which means that a sufficient quantity to treat my entire orchard would give me a saving of $1,215.00 or 25% less than the cost of other fixed nicotine combinations.

The excellent condition of the foliage and trees was noticeable. There was no leaf hopper injury which in some orchards was bad in 1938.

Particularly important is the fact that we reduced our percentage of wormy fruit from 18% in 1937 to 2% in 1938 and there were hardly any stings in the orchard where NICO-SOL was used.

Our experience with NICO-SOL has been very satisfactory.

Yours truly,
J. W. FUNK
The Funk Orchards, Vincennes, Indiana.

## OTHER STANDARD DORMANT OILS

**DENDROL SUMMER SPRAY OIL**
An all purpose highly uniform dormant spray oil.

**STANDARD APHID SPRAY OIL**
A positive dormant, one application Aphid control.

**SUPERLA SUMMER SPRAY OIL**
Ideal for use with fixed nicotine or nicotine sulphate.

***Write for literature giving complete information on all products.***

## STANDARD OIL COMPANY *(Indiana)*

910 SOUTH MICHIGAN AVENUE, CHICAGO, ILLINOIS

*Protect*

YOUR ORCHARD

*with*

CHIPMAN SPRAYS

HI-TEST LEAD ARSENATE

Greater safety to fruit and foliage plus added killing power against codling moth.

•

COPPER-HYDRO

A neutral, safer copper fungicide. Sticks better for lasting protection. Especially recommended on cherries and apples.

•

MICROSULFUR

A dry flotation sulfur, instantly wettable. Microscopically fine. Safened. Superior sticking to fruits.

*"Each Product With An Added Measure of Value"*

*Write Nearest Office for Circulars*

CHIPMAN CHEMICAL CO.
INCORPORATED

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Winchester, Va. — No. Kansas City, Mo.
Chicago, Ill. — Palo Alto, Cal.
Orlando, Fla. — Houston, Tex.

DI-CHLOR-MULSION

*The Original Ethylene Dichloride Emulsion for Use Against the*

*PEACH TREE BORER*

The safest, most effective and most modern chemical for control of this insect.

*Write for pamphlet giving full information*

THE J. W. WOOLFOLK COMPANY
FORT VALLEY GEORGIA

PENETROL

*and*

NICOTROL

Manufactured by
KAY-FRIES CHEMICALS, Inc.
100 Madison Ave. — New York City

BLUEBERRIES A PROFITABLE ORNAMENTAL

Be the first to raise CULTIVATED BLUEBERRIES. The coming sensation. Very ornamental. Exquisite white blossoms; leaves change from green to red; grows 6 ft. tall. Eat delicious jumbo sized berries with cream. Two to four bushes will supply average family with mouth-watering blueberry pies all season. Big money-maker for planters. Sell from 50c to 75c a quart. Fully described in our catalog of over 100 real bargains in plants, trees and shrubs. Write now.
Whitton-Ackerman Nursery, Box 77, Bridgman, Mich.

## NAI LAUNCHES NEW REVENUE PROGRAM

MAINTAINING their progressiveness, leaders of apple advertising throughout the nation met as members of the National Apple Institute at Carbondale, Ill., forepart of last month to discuss a new approach to the all-important question of revenue for advertising activities. Sum and substance of their plan is to promote the passage in the important apple producing states of laws that will assess all apples sold, the revenue to be used by state apple advertising commissions to promote apple consumption.

Leader of these apple leaders was the country's number one apple promoter, Major C. E. Chase, secretary-manager of Washington State Apple Advertising Commission. Chase, as head of the Washington advertising group, directed the expenditure of more than $175,000 for all forms of apple advertising during the 1937-38 season. He told of the origination of the Washington law, the system of revenue collection, and of the success so far achieved by his organization in working with Washington growers.

Questions from representatives of other sections were many and varied, but Chase continually maintained that he believes similar action on the part of other states will result in more successful apple promotion.

Present to lend his advice during the discussion was U.S.D.A.'s Porter Taylor, who has aided citrus groups with their promotional endeavors.

NAI's secretary, Dr. H. E. Barnard, presented letters from those states not having representation at the meeting. Letters indicated that most apple areas are in favor of such a plan. At conclusion of the session, after President Kirk L. Keller had called for statements from sectional leaders, Barnard summarized, "We have definitely started the movement. It now remains for the state and sectional groups to inform their growers, and, if growers are for the revenue plan, to take it before their officials."

## PEACH BORER CONTROL

*(Continued from page 22)*

Plant Quarantine, U.S.D.A. Information on this device may be obtained upon application.

After his talk on ethylene dichloride emulsion control at the Tennessee State Horticultural Society meeting, Dr. Snapp was asked by a grower if a prepared ethylene dichloride emulsion could be purchased on the market. He replied that five or six spray chemical companies are now selling the prepared emulsion, ready for dilution according to their directions and application as he has advised.

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SAVE Money—Order at Low Cost Your Favorite Magazines

Club No. 1 — ALL SIX ONLY $1.00
AMERICAN FRUIT GROWER 1 yr.
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The Home Friend 1 yr.
Mother's Home Life 1 yr.

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Club No. 5 — ALL FOUR ONLY $1.40
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McCall's Magazine 1 yr.
Household Magazine 1 yr.
The Country Home 1 yr.

Club No. 207 — ALL FIVE ONLY $1.00
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Good Stories 1 yr.
Poultry Tribune 1 yr.

Club No. 208 — ALL FIVE ONLY $1.00
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for One (1) Year and Your Choice of Any Two of the Following Magazines for ONLY ..... $1.45

Check Two

( ) Christian Herald ..... 6 mos.
( ) American Boy ..... 8 mos.
( ) Household Magazine ..... 2 yrs.
( ) Woman's World ..... 2 yrs.
( ) Romantic Story ..... 1 yr.
( ) True Confessions ..... 1 yr.
( ) McCall's Magazine ..... 1 yr.
( ) Silver Screen ..... 1 yr.
( ) Open Road (Boys) ..... 1 yr.
( ) Parents' Magazine ..... 6 mos.
( ) Pathfinder (Weekly) ..... 1 yr.
( ) Home Arts Needlecraft ..... 2 yrs.
( ) Poultry Tribune ..... 2 yrs.
( ) American Poultry Journal ..... 2 yrs.
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( ) Successful Farming ..... 2 yrs.
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Alternate Offer — AMERICAN FRUIT GROWER, 1 yr. and your choice of any three publications listed above for $1.75.

AMERICAN FRUIT GROWER, 1370 Ontario St., Cleveland, Ohio.

These offers are good only in U. S. A.

Enclosed find $..... for which please send me the magazines marked with an X.

Name .....

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R. F. D. ..... State .....

University of Idaho
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# CITRUS PEST CONTROL IN TEXAS

*(Continued from page 15)*

the fruit have caused growers to realize the necessity for effective control. W. H. Friend, superintendent of the Rio Grande Valley Experiment Station, states, "A severe infestation of red scale not only affects the fruit crop during the season in which the damage occurs, but may cause a decrease in the crop for several years to come." Applications of quick breaking oil emulsion give satisfactory control, but the strength at which growers have to use it and the resultant high cost prohibits the general use of this material. After a number of years of experience, growers have found that "tank mix" oil emulsion is most effective and economical. Applications during April, May, and July produce commercially clean fruit.

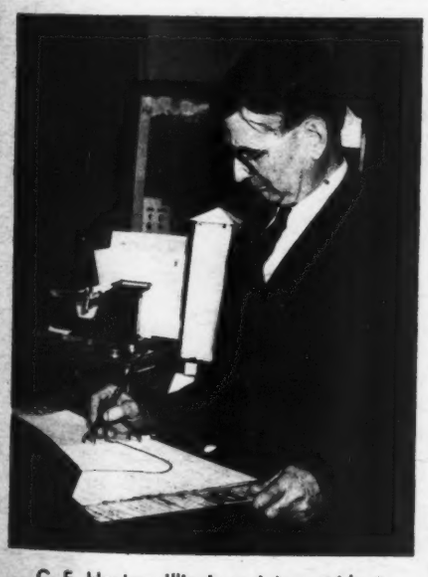
*Rust Mite.* Oranges and grapefruit that have been attacked by rust mite not only have a rusty, unattractive appearance but are 10 to 20 per cent smaller in size. Fruit damaged by mite is apt to decay more rapidly. Spraying with lime sulphur to control this pest has largely been supplanted by dusting with finely ground sulphur. By dusting in June and again in September if necessary, rust mite damage is held to a minimum.

*Red Spider.* These tiny sucking insects withdraw sap from the leaves and lower the vitality of the plant. Like rust mite, they are most troublesome in dry weather. Fortunately, the control measures for this pest are the same as for rust mite.

Most Texas citrus growers realize the importance of producing clean fruit. Citrus trees are sprayed and dusted with as much care as powder and perfume are bestowed upon the brow of a sparkling debutante.

Modern power spraying equipment

*(Continued on page 43)*



C. F. Heaton, Illinois society president, was among first to register for meeting.

SECRETS of SUCCESS
in
PRUNING
Enjoy more, better fruit and flowers. Only genuine "Snap-Cuts" give this clean, easy-cutting action. Won't tear bark. Chrome finish; comfortable non-pinching handles; one hand spring catch. No. 119, as illustrated (8" long). At dealers or sent prepaid for $2.00. Also No. 118 (6" long) handy pocket size. Cuts ½" branches, $1.25. Money back guarantee. Free circular.
SEND FOR "Secrets of Success in Pruning," famous illustrated 40-page book describing proper pruning practice. Booklet only 10c, or sent FREE with pruner.
"Snap-Cut" PRUNERS
Made only by Seymour Smith & Son, Inc.
36 Main St. OAKVILLE, CONNECTICUT, U.S.A.

**A Wonderful Place for You and Your Family**

This Modern, homelike Hotel, on FLORIDA'S most healthful SOUTHEAST COAST, affords a refined atmosphere for rest. Situated in a beautiful three acre park of tropical palms, shrubbery, flowers and fruits—along the Boulevard leading to one of the finest beaches in Florida. ONLY 25 minutes' drive to MIAMI and its varied diversions. GOLF, FISHING, SHUFFLEBOARD, OCEAN BATHING, TENNIS, CLOCK GOLF, Etc.

Pleasingly moderate rates — Rooms $2.50 up. AAA in every way.

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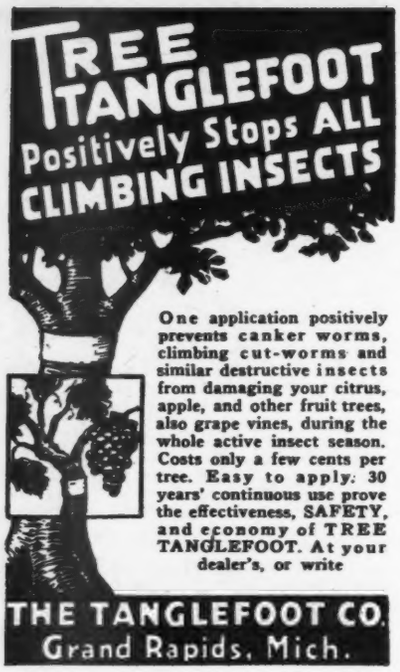
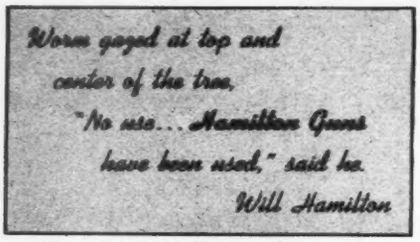

TREE TANGLEFOOT
Positively Stops ALL CLIMBING INSECTS
One application positively prevents canker worms, climbing cut-worms and similar destructive insects from damaging your citrus, apple, and other fruit trees, also grape vines, during the whole active insect season. Costs only a few cents per tree. Easy to apply. 30 years' continuous use prove the effectiveness, SAFETY, and economy of TREE TANGLEFOOT. At your dealer's, or write
THE TANGLEFOOT CO.
Grand Rapids, Mich.


Worm gazed at top and center of the tree,
"No use... Hamilton Guns have been used," said he.
Will Hamilton
Spray Guns with Controlled Streamline
W. L. HAMILTON & CO.
BANGOR · MICHIGAN
Six Models · A GUN FOR EVERY PURPOSE
Send For Catalog

McCLAIN LITTLE WONDER POWER SPRAYER
ORCHARDISTS
GREENHOUSES
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ESTATES
Here IT IS AT A PRICE YOU CAN NOW AFFORD TO PAY
THE SPRAYER OF MANY USES
The inexpensive, complete sprayer that you have been wanting for saving your fruit, berries and vegetables from insects and parasites.
Runs whole day on a few cents worth of gasoline.
Instant clutch control. Rugged pump with stainless steel valves, porcelain lined cylinder. Built for work.
Disinfect poultry houses, barns. Whitewash buildings, fences. The low price will amaze you. Write today.
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GET Jim Brown's PRICES on
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Save money as 1,500,000 others do. Get my 50th Anniversary Bargain Book. It's FREE. Quotes FREIGHT PAID and POSTAGE PAID prices. Don't miss this book! Write NOW!
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MAKE YOUR LITTLE FARM PAY
Get a BOLENS heavy duty Garden Tractor for plowing, harrowing, discing, field and garden cultivating, mowing, spraying, digging, belt power. Also BOLENS Power Hoe and other models, for light gardening and lawn mowing. $78.50 up f.o.b. factory. It's fun to run a BOLENS.
BOLENS GARDEN TRACTORS
2916 Park St., Port Washington, Wis.


## APS NEWS

*(Continued from page 18)*

al study, we are carrying on certain laboratory investigations which supplement the above study. The results of these laboratory investigations will be reported from time to time. Since they probably represent a smaller part of the whole research program, it will be easier to prepare short papers representing that portion of the results. . . .'

"As a result of this work, which was prosecuted vigorously, it became possible for the Public Health Service, through a report to the Secretary of the Treasury, of which the Public Health Service is a part, to advise the Secretary of Agriculture that the tolerance on lead, so far as their results indicated, could be raised to .025 grains per pound.

"The effect of this action has been fourfold. First, it has checked the continued downward revision of the lead tolerance toward the point of .014 grains of lead previously announced by the Department of Agriculture as its goal, and the possible elimination of lead arsenate entirely.

"Second, it has greatly mitigated difficulties already encountered in residue removal throughout the entire United States, particularly in the Pacific Northwest.

"Third, it has pointed toward the possibility of further upward revision.

"Fourth, it has given the fruit grower an opportunity to defend himself, legally, if necessary, from slanderous charges of poisoning the public.

"By action of the Secretary of Agriculture (on November 14) the fluorine tolerance has been raised from its former .01 to .02 grains of fluorine per pound of fruit. The result has been the release in Wenatchee of many lots of fruit carrying fluorine in quantities between .01 and .02 grains per pounds. In that part of the United States fluorine, as cryolite, has become an important insecticide for codling moth control, and gives promise of increasing usefulness. It has not proved suitable for use for that purpose, however, in the Middle West and East, although it seems to have possibilities for the control of curculio on peaches. It also seems useful for controlling certain insects attacking non-fruit crops.

"It is the conviction of the Spray Residue Committee that the work of the Public Health Service on lead arsenate residues should not be allowed to lapse, and should be actively encouraged by co-operation in all possible ways. Because of its proven possibilities in the Pacific Northwest, work on fluorine sprays should be added, but not at the expense of the work with lead arsenate.

"Appropriate also to this report is a brief discussion of the necessity for further search for a substitute for lead arsenate, because of its injurious accumulation in the soils of the Northwest and possibly elsewhere, and its injurious effect upon apples and apple trees in the humid climates of the Middle West and East.

"It is the hope of this committee that the work to find a substitute for lead arsenate will be expanded, and that further work will be initiated. It is the suggestion of the committee that a statement to this effect be prepared and forwarded to the Secretary of Agriculture."

Attention is directed to this report for several reasons. In the first place research on humans who were in daily contact with spray materials revealed that the tolerance on lead and fluorine could be raised with a proved certainty of doing no injury to the public. In the second place, it points out that research should not be abandoned at this time, but should continue long enough to thoroughly establish the facts.

H. L. Lantz
SECRETARY

IN NEW YORK
HOTEL McALPIN
"A GREAT HOTEL"
LARGE ROOMS, NEWLY FURNISHED & DECORATED
SINGLE from $3. DOUBLE $4.50
1 BLOCK FROM PENN. STATION
B. & O. Motor Coaches stop at our door.
SPECIAL FLOOR DEVOTED TO WOMEN GUESTS EXCLUSIVELY
HOTEL McALPIN
BROADWAY AT 34th ST., NEW YORK
Under KNOTT Mgt. John J. Woelfle, Mgr.

## REPAIR PROBLEMS

*(Continued from page 36)*

necting rod bearings, care should be taken that the fit is left just snug, but with bolts tight and cotter-keyed. To be sure that the lubricant reaches the moving surfaces of shafts, remove and check grease cups or fittings. Or, if the crankshaft runs in an oil bath, drain, flush, and refill the crankcase to the proper level with oil of recommended grade.

Unless they are mechanically minded and have complete workshop facilities, most growers find that it's wise to have the sprayer engine looked after by the local garageman. Growers for the most part, however, know how to take care of the pump. Those who have power takeoff outfits should be able to service the entire rig themselves.

Checking of the rig on points not previously mentioned is relatively simple. Belts, chains, and sockets should be checked for tension and alignment. Such checking will bring out weaknesses where they exist. At least the outside of the tank should be coated with a good implement paint after both the outside and inside have been cleaned. It's a good idea to clean and paint all exposed metal parts. Probably the last repacking job, best done before painting, is the agitator shaft gland. Last in order of sequence, but not in importance, are greasing of wheels and steering device, tightening of bolts, and checking of tires.

## CODLING MOTH CONTROL

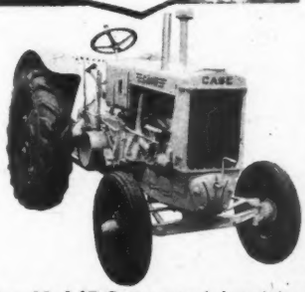
*(Continued from page 31)*

Combined with any spray schedule and absolutely necessary from the point of efficient control and economy of operation is a good program of orchard sanitation including clean-up of hibernation quarters which may permit large numbers of codling moth to go through the winter, removing surrounding unsprayed trees which may act as a breeding nursery for the codling moth, the proper disposition of culls outside the orchard, and a careful study of your local situation, particularly the packing shed which may be one of the most important factors in permitting the continued build-up and continuation of a codling moth infestation in your orchard.

Hoosier fruit grower E. E. Byers, was forced to apply two and a half pounds of nitrogen fertilizer to each of his young peach trees when they showed signs of delayed growth after he had mulched them with 50 pounds of straw per tree.


# What Did I Tell You.. CASE COSTS LESS TO RUN

. . . and here's a PERFECT FIT FOR FRUIT OR FIELD



This new Model R Case tractor is just right for good work with two plows under all average soil conditions. It is compact enough for work among fruit, makes quick, short turns with full load, yet is fully suited to open field work. More powerful fruit specials are the "CO" and "CV."

Just because you raise fruit is no reason to pay a high price for power. Case Orchard and Vineyard Specials have the same power-saving transmission and other economy features and produce power at the same low cost as other Case models.

Case tractors are geared and balanced to get good fuel economy, but the biggest savings they bring are in the costs where tractors differ most—upkeep and depreciation. Case tractors 8, 9, and 10 years old, after a total of more than FOUR MILLION working hours show repair costs averaging about 1¼ cents an hour . . . only a fraction as much as for ordinary tractors. Owners declare these tractors are still good for an average of 9 years MORE.

Start now to enjoy these big savings in doing YOUR work. See for yourself the secrets of Case economy at your Case dealer. Mail the coupon today for book that means money in your pocket.

**SEND FOR FREE BOOK**
**"THE FACTS IN THE CASE"**
See how six thousand years of tractor experience show the way to proved power savings. Fill blanks and mail to J. I. Case Co., Dept. B-12, Racine, Wis.

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CASE

**KINKADE GARDEN TRACTOR**
**and Power Lawnmower**
A Practical, Power Plow and Cultivator for Gardeners, Suburbanites, Florists, Truckers, Nurserymen, Fruit Growers
Low Prices - Easy Terms
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Whitton-Ackerman Nursery, Box 89, Bridgman, Mich.

**Martin HUMMER ORCHARD WORKER**

Levers adjustable. Can be let down, so as not to strike limbs and fruit.
"Every fruit grower, large or small, should have a MARTIN HUMMER!" — Gilbert Meister, Vice Pres. American Fruit Grower, who uses Martin in his own orchards. Fastest tool for scientific Row Cultivation, Terracing, Ditching, Irrigation, Spray Pipeline Trenching, Digging, Cleaning Ponds.
**10 DAYS TRIAL**
Use a HUMMER 10 days in your own orchard work. Then, if you'd part with it, we'll refund every cent.
Steel Blade Extension works close to trunks as desired. Quickly attached or taken off.
Finest, sturdiest, all-steel construction. Costs no more than ordinary farm tools. Easily operated by farm tractor or animals. Martins used by experienced orchardists many years. Now HUMMER—*latest!*
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Helps protect your products from spoilage
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Free from odor . . . sanitary
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500,000 **PEACH** in a large assortment of varieties and sizes. Buds cut from bearing orchards, assuring planters of trees true to name.

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**F. B. MILLS Seed Grower, Box 305, ROSE HILL, N. Y.**


## STATE NEWS

(Continued from page 30)

"Quality must be improved and maintained by adequate inspection. With a product of established quality which the consuming public can depend upon, we are prepared to meet the challenge of any competitor.

"During the past year we have established standards for our agricultural products and provided for inspection. We are now prepared to advertise and promote these products under authority of the State Trade Mark and Brand law enacted last year."

**NEBRASKA**—Supplementing his talk on new varieties developed at Ames, Iowa, station with actual specimens, Prof. H. L. Lantz gave eastern Nebraska growers in their annual meeting with the horticultural society an opportunity to really become acquainted with these new types.

Joan, a highly colored, above medium size sort, which ripens shortly after Wealthy, took the eye of the growers. Two crosses of Jonathan x Salome have been named Secor and Edgewood.

Need for hardier stocks was stressed by Prof. Lantz. Damage done by the severe 1935-36 winter to our common commercial varieties would seem to warrant the additional expense of topworking these varieties on such hardy stocks as Virginia Crab, Hibernal, or possibly Sheriff.

The society went on record as favoring the resolution proposed by the American Pomological Society in its annual meeting at Chattanooga, namely, that the Federal government should regulate the interstate flow of culls where serious damage may be done to the fresh fruit market for the higher grades. —E. H. HOPPERT, Sec'y, Lincoln.

MONTANA—Horticulturists at the 42nd annual meeting of the State Horticultural Society in Kalispell elected the following officers to serve in 1939: Ray Fehrenkamp, Stevensville, president; J. O. Wright, Darby, first vice-president; W. E. Bernard, Missoula, second vice-president; D. S. Ward, Bigfork, third vice-president; George L. Knight, Missoula, secretary-treasurer.

Future development of the horticultural industry in the State is dependent upon enlarged marketing facilities and increased consumption, in the opinion of leaders present at the meeting. Lively round-table discussions on the subject were led by Malcolm Sizer of Hamilton and F. W. Young of Bigfork.—G. L. KNIGHT, Sec'y, Missoula.

ILLINOIS—Enjoying excellent attendance, a full and varied program and a portion of their sessions in connection with the National Apple Institute meeting, members of the Illinois society held their annual meeting at Carbondale in January. A novelty of the meeting was a radio broadcast by Dean J. C. Blair of the College of Agriculture. Unable to attend because of work at the college, Dean Blair talked to his many friends at the meeting over station WILL.

C. F. Heaton, New Burnside, was re-elected president. Other 1939 officers are O. G. Jones and Logan Colp, vice presidents; W. S. Perrine, treasurer; Arthur Bryant, V. L. Page, Paul Ringhausen, Fred Hawkins, Frank Chatten and Frank Penstone, directors.—JOE B. HALE, Secretary, Kell.


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NEW ASTERS

THE GLOBE SEED CO. Box 20, St. Charles, Ill.

## CITRUS PEST CONTROL IN TEXAS

*(Continued from page 39)*

is used. Most spray outfits are mounted on trucks. Many grove owners have tractors and power take-off dusting equipment makes the task easy and rapid.

Spraying and dusting operations combined cost from $10 to $15 per acre. This expense item in the production of citrus fruit no doubt brings as large return as any other step in producing a golden harvest.

### Citrus Spray Calendar for Texas

*March*—Spray with lime-sulphur or dust with sulphur when most of the blossom petals have fallen. (For rust mite and red spider.)

*April*—Spray trees with tank mix oil emulsion to prevent scale from spreading to the fruit.

*May*—If further evidence of scale, spray with tank mix oil emulsion.

*June*—Watch for rust mite and red spider activity. If necessary spray with lime-sulphur or dust with sulphur.

*July*—If scale is present on new growth or on fruit, spray with tank mix oil emulsion.

*September*—If fruit has small rust-like areas on surface, or tiny silvery spots on the foliage, spray with lime-sulphur or dust with sulphur. (For rust mite and red spider.)

### Tank Mixed Oil Emulsion Spray

1½ gallons paraffine base engine oil. (The oil should be distilled at the refinery at 575 degrees F to 700 degrees F.) Purity test 90 per cent.

4 ounces powdered blood albumin, mixed with 12 ounces fuller's earth.

100 gallons water.

Fill spray tank with water, start engine, and add oil, then add blood albumin. Only power spraying equipment capable of 200 r.p.m. with four agitators should be used.

Taking a brief rest from the busy Indiana Horticultural Society meeting sessions are S. W. Holmes, Mitchell (left), and Harold Hall, Seymour.


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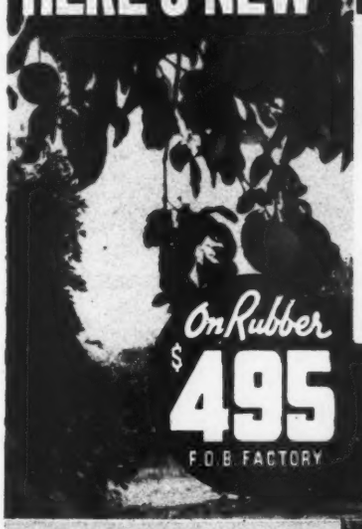


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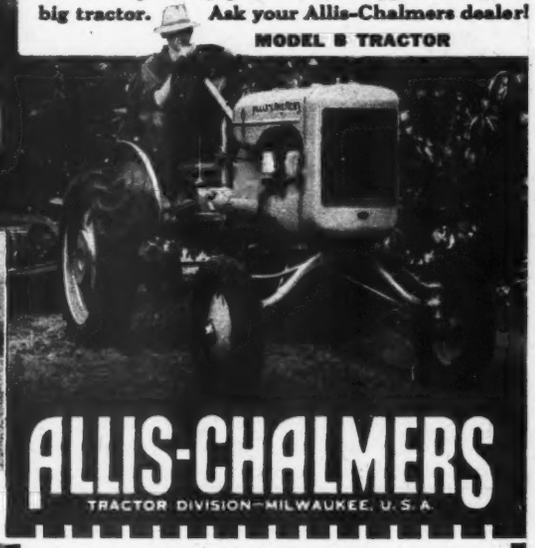
MODEL B TRACTOR



MOWING—Model B operates 5-foot Full View Safety Mower up to 4 miles an hour. Mower is side mounted, gets in corners, ideal for orchards.

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HAULING—Model B hauls up to 7¾ miles an hour. Shown here operating power sprayer.

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- ☐ MODEL RC TRACTOR 2-row, air tires, $785
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- ☐ IMPLEMENTS FOR RC, WC 2-row interchangeable
- ☐ MODEL WF Standard tread, 2-plow
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100 ELBERTA PEACH TREES 2-3 FT. $7.50. BETTER prices in larger quantities, other grades and varieties. CHATTANOOGA NURSERIES, Chattanooga, Tennessee.

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# 1939 SPRAY ARMY

*(Continued from page 35)*

and dusters. Many of these are improvements of old types, some of them the result of new research and manufacturing methods.

Having come this far in the improving of spraying and dusting equipment, what of the future? Progressive growers naturally will look forward to continued advancement both in spray and dust materials and spray and dust machinery. With better materials and better equipment provided, growers must show themselves willing to learn the most efficient methods and means of using them. The problem of pest control can't be left in Nature's hands. Only in one instance has a major fruit insect pest been controlled by parasites in commercial operations. There is no recorded case of a resistant fruit plant commercially practical. Our pest control future, then, lies in the proper use of the best of modern materials together with the most modern of spraying and dusting equipment.

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During his talk on fruit farm cold storages at the Illinois society meeting, Clarence E. Baker, Purdue University, told of an Indiana grower who spent $37,000 for storage fees in five crop years. For the same money he could have built and maintained a 30,000-bushel farm cold storage.

# NEW

- INSECT LIGHT TRAP
- PEST RIDDANCE

By HANDY ANDY

**Time after time, I've noticed that the one subject that always receives attention of growers in their meetings and discussions is pest control. While other phases of our fruit production are of extreme importance, it seems that we must constantly be on the lookout for new and better ways to conquer insects and diseases. Fortunately, there are institutions and firms who, by their research and education, help us toward a goal of more efficient control.**

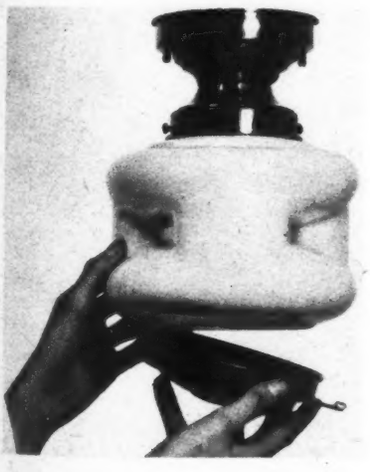
## INSECT LIGHT TRAP •

When, a few years ago, a prominent midwestern fruit grower screened in his storage and packing house, he was amazed to find that more than 400,000 codling moths were caught by the screens as they emerged in late spring. Of course, it would take a long time to count this number of moths, but entomologists from the state university lent their assistance.

A recent introduction recalled this grower's experience, for there is now available a light globe made especially for catching insects. Its application to fruit farms, at least to my way of thinking, lies in its use in packing houses and storages or on the outside of the fruit farmstead buildings.

For growers who operate roadside markets, the globe would help in keeping down all kinds of troublesome insects that fly around at night. While it acts as an efficient insect trap because it kills the bugs by heat when they enter its side openings, the globe gives equally as brilliant illumination as the usual bulb cover.

As shown in the accompanying illustration, the globe comes with a removable bottom, easily emptied of the dried insects. Another model of the light trap does not have the detachable bottom. For permanent installations, the globe is fitted with



a ceiling holder, but it also comes with a portable attachment that fits on ordinary light sockets.

Operation of the trap is simple and direct since light attracts moths and other insects and the superheated air kills them. Manufacturers state that the light trap has been carefully tested on experimental farms in all sections of the country and that on a night its "catch" has ranged from 1000 to 1500 insects, including all night-flying types.

## PEST RIDDANCE •

An attack of climbing cutworms in any fruit planting is a headache, but when a whole army of them starts working on more than 20 acres of grapes we can offer well-qualified sympathy to the grower. And sympathy was all that Major Womeldorff, Ohio grape producer, had until he saw the healthy new growth of his vines being consumed by these crawling pests. Then he hurried to follow the advice of his extension entomologist. At his orchard supply store he obtained some tree tanglefoot and this worm-entangling mixture was placed on the trunks of the vines

and on the ends of trellis wires, as shown in the accompanying illustration. A band of the tanglefoot was all that was necessary on each of the vines and wires to stop the cutworms and save Mr. Womeldorff's new grape growth.

Observations have shown that the pesky cutworm is more active during cold, damp springs. They overwinter in litter and debris on the ground and are destructive on tree fruits as well as grapes. As with many another fruit insect, tree tanglefoot is their bugaboo and it can be placed on all types of fruit plants with no danger of injury.

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In line with my plan, announced last month, of presenting in this department new books and booklets, here's one that I've just looked over. FOR A BETTER FRUIT CROP FERTILIZE WITH 'AERO' CYANAMID contains practical and interesting information on the use of cyanamid as an orchard plant food. Besides directions for tree fruit use of the fertilizer, there are recommendations for its application to grapes, strawberries, and the brambles. A brief schedule simplifies the application directions. Nutrient needs of cover crops are also discussed.


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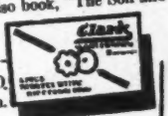


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# SUCCESSFUL ORCHARDS

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## CONTRIBUTORS OFFER RABBIT CONTROL HELPS

SINCE presenting the experiences of an Ohio grower in preventing rabbit injury to young fruit stock on the December "Round Table" page, several readers have sent in letters and cards containing their own ideas on this subject. Varying from types of materials to a method of preventing tree damage from protectors, these experiences reflect the importance of the rodent and rabbit control problem. The following discussions give an insight into the methods used by practical orchardists in combating one type of fruit farm pest.

### JOHN H. HOOVER, MISSOURI

APPROACHING the problem in a manner different from that of using a mechanical barrier, Mr. Hoover relates:

"I am sending you a recipe for protection of young fruit trees against rabbits. I melt hog lard and stir in enough sulphur to make the mixture yellow. This mixture is applied to the trees with a small paintbrush. Application is made in October or November, before real cold weather begins. The mixture must be kept warm. A very thin coat is sufficient for protection. Some growers in our locality have used this remedy successfully for 50 years."

### MRS. L. H. NORTON, TENNESSEE

"TO prevent rabbit injury to young trees," says Mrs. Norton, "I use a fresh hog liver and rub this on the trunks and lower branches or as far up on the trees as there is danger of rabbits feeding. I have used just one treatment of this kind early in the winter before the rabbits become troublesome in the orchard. They will absolutely not feed on the treated parts of the trees. But, in some cases where the trees were not rubbed high enough, the rabbits fed on the untreated tree parts. I do not have to treat the trees more than once each winter."

It's apparent that Mrs. Norton is sure of her rabbit control methods, for she concludes, "I'd like to have other fruit growers try it and be convinced." And if readers try out this method, let your "Round Table" editor know how it works.

### O. H. FREELAND, MICHIGAN

IT seems that Mr. Freeland feels that the use of hog rings to fasten wire mesh tree guards together is unnecessary. His letter explains the method he uses.

"Mesh guards for young fruit trees may be made by buying the wire in widths of three or four feet. With tin shears cut down through the center, not in a straight line but first to the right of the center and then the next wire to the left of the center. This gives a staggered effect with every other wire the same length. A few of these longer ends are bent into hooks and when the mesh is placed around the tree the hooks hold the guard together. The guards are easily unfastened when the tree gets too large, and they also save the expense of the hog rings or some other extra attachment to hold the guards together."

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## EACH FOR YOUR NEW IDEAS

Here, each month, growers get together to discuss experiences and ideas. The beginner as well as the veteran discovers many practical suggestions for better and more profitable fruit growing. You, too, have some experiences that will be helpful to fellow growers. Send them—briefly written on a penny card is satisfactory—to "ROUND TABLE EDITOR," AMERICAN FRUIT GROWER, 1370 Ontario St., Cleveland, Ohio. One dollar will be paid for each item published on this page.

Below is shown what can happen to young apple trees when rabbits start their ruinous work on unprotected fruit stock.

### HARRY SPARROW, ILLINOIS

A BIT of variation coupled with an age-old horticultural practice is contained on a recent card from Mr. Sparrow.

"To prevent my young trees from getting peeled and gnawed by rabbits, especially in winter, I go to our local butcher and get a bucket of blood. The visit is made while he is killing either cattle, hogs, or sheep. With a paintbrush or old broom I apply the blood to the trees up as high as rabbits can reach. There is nothing so offensive as the smell of blood to a rabbit."

Ancient Roman gardeners were perhaps the first to realize the effects of blood for preventing damage to their plants. While they contended that the spirit of the animals from which the blood came plagued the rabbits, we know that it was the odor that brought results. Many vegetable gardeners still use dried blood scattered among their plants to protect them against rabbits.

### H. E. NICHOLS, IOWA

"I HAVE read with interest the article in the December issue about wire mesh guards for protecting young fruit trees from rabbits. We have recommended these and used them and have seen them used in many orchards here in Iowa the past 20 years.

"There is one caution, however, that I think should be made, and that is that when the guards are put around a newly-planted tree, wind-whipping will rub the trunk on the upper edge of the wire. I have seen some trees cut halfway in two.

"To overcome this, we have recommended where rabbits do not cause damage until the fall after setting that the use of protectors be withheld until that time; or, if it is necessary to put the protectors on at planting time, that something be wrapped around the tree trunk where it comes in contact with the wire to prevent damage."

Mr. Nichols, a member of the horticultural department at Iowa State College, has certainly offered a practical pointer through his "Round Table" discussion.

### M. C. LINTHICUM, MISSOURI

NOT wasting any time in letting us have his brief but practical information, Mr. Linthicum points out:

"Here's how I protect my small trees from rabbits in winter. I cut cornstalks the lengths required and bind them around the trunk with a couple of small wires. This system gives perfect protection, and labor is the only cost item in corn-producing sections."

Mr. Linthicum's system of using the cornstalks is similar to that followed by many other growers who employ a variety of materials for wrapping about trees. Among these materials are tar paper, newspapers, gunny sacks, burlap, or heavy crepe paper strips and heavy wrapping paper.

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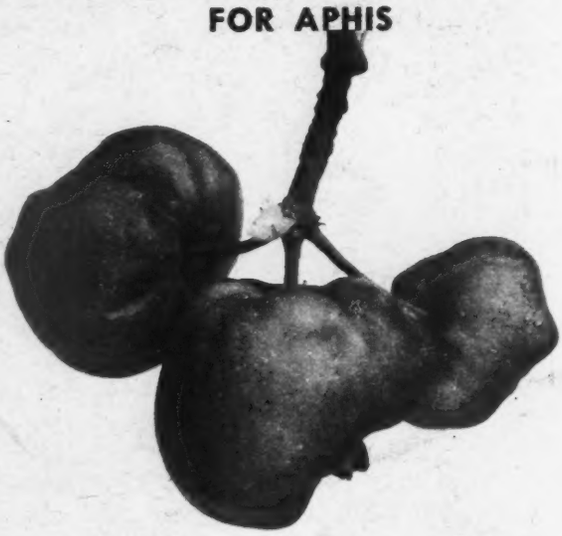

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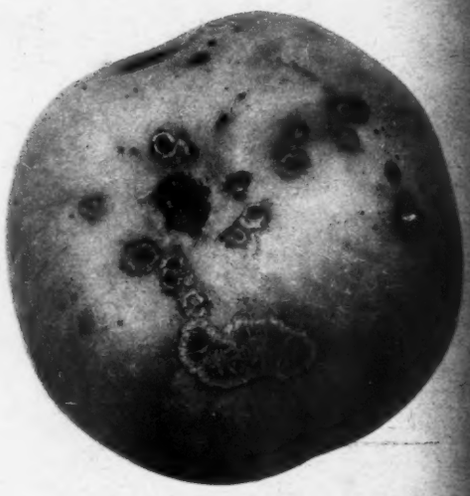

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